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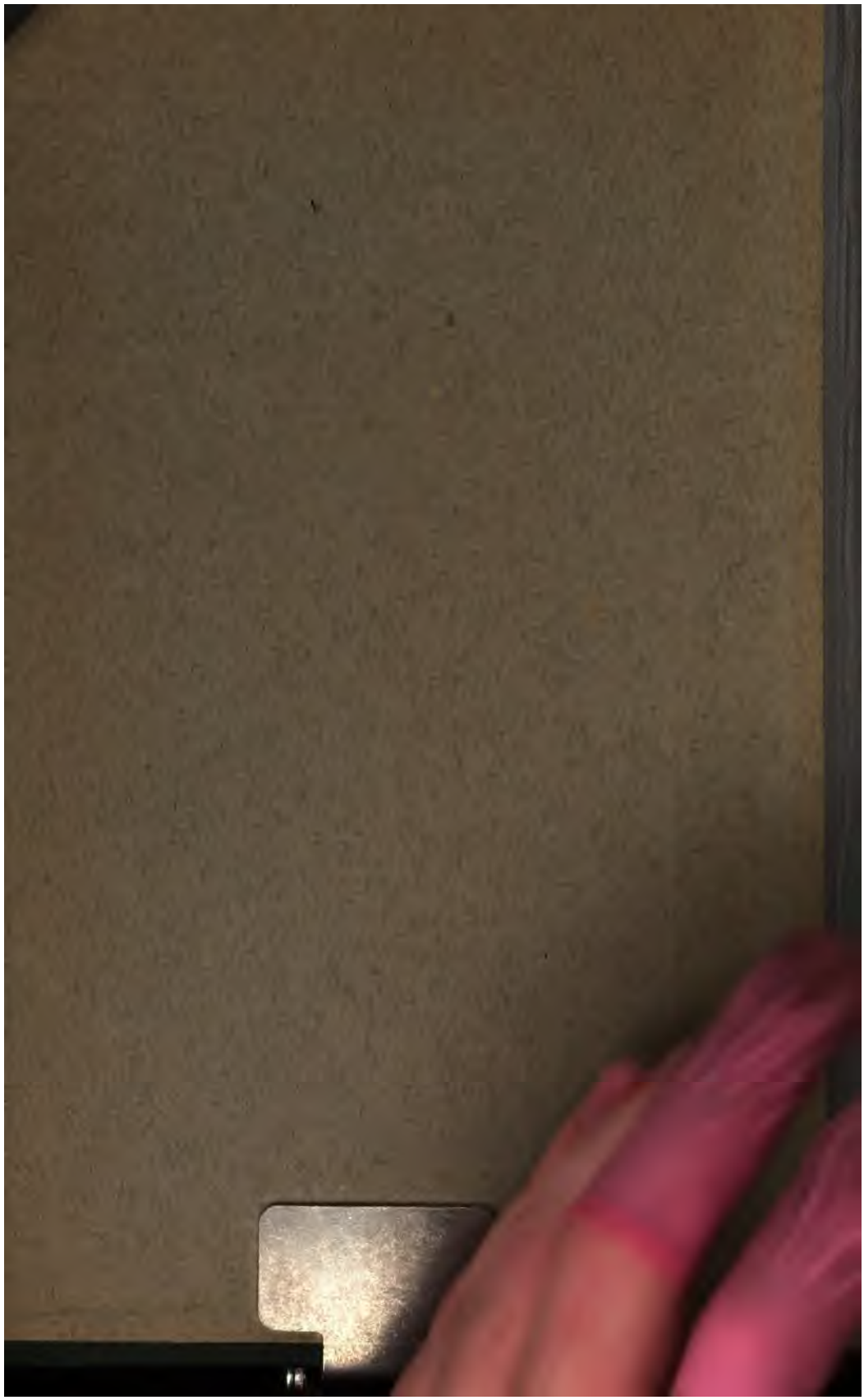
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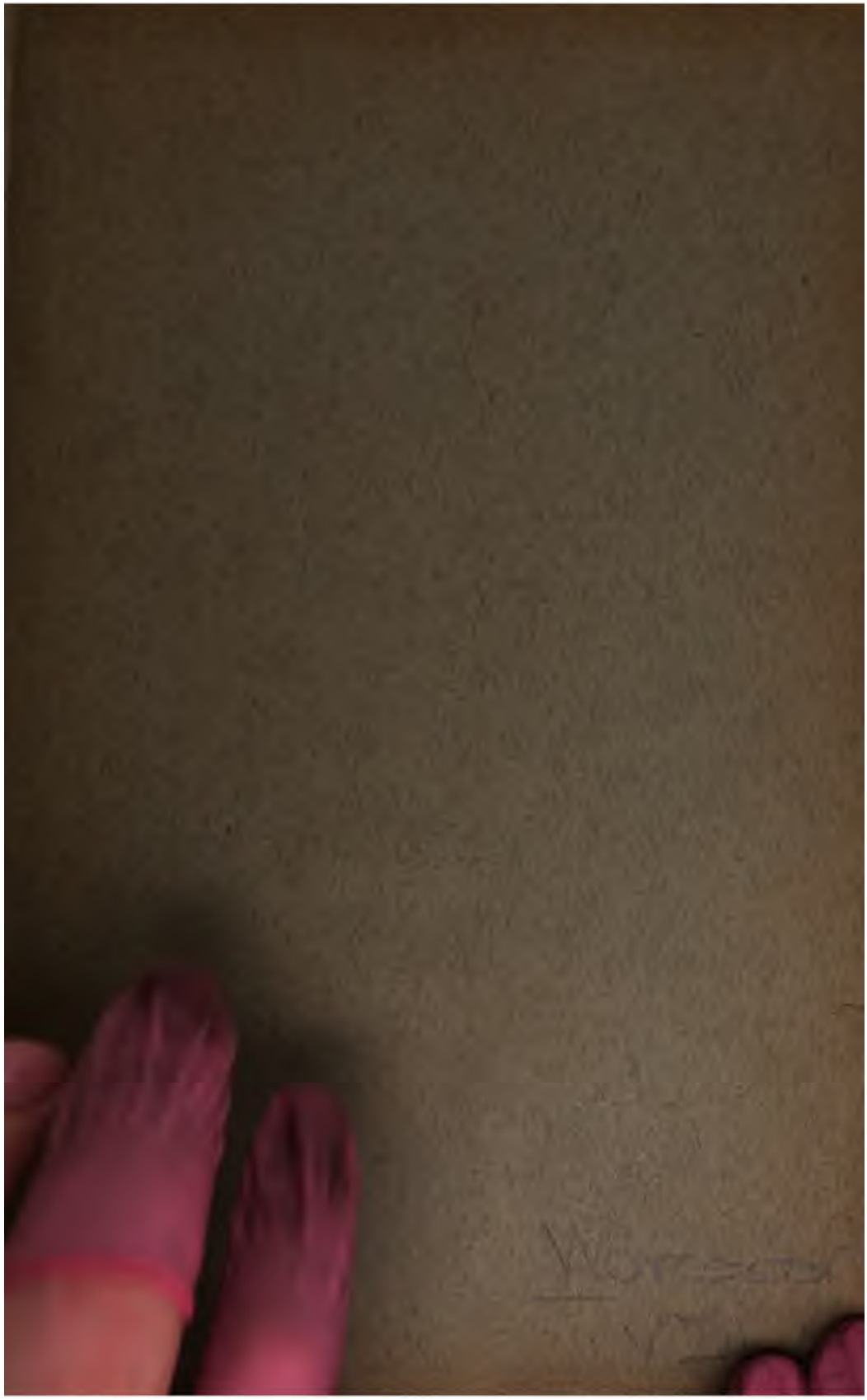
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ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR AND THE CITY ENGINEER

OF THE

CITY OF WORCESTER,

FOR THE

YEAR ENDING NOVEMBER 30, 1901.

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WATER COMMITTEE.

Alderman LOUIS J. KENDALL,
Alderman H. AUGUSTUS HARRINGTON,
Alderman L. B. STONE,
Councilman GEO. M. WRIGHT,
Councilman DAVID A. DONLEY,
Councilman FRANK L. DEAN,
Councilman JOHN J. POWER.

WATER COMMISSIONER.

JOHN G. BRADY.

WATER REGISTRAR.

GEO. W. BATCHELDER.

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ANNUAL REPORT OF WATER COMMISSIONER.

To the Honorable City Council of the City of Worcester.

Gentlemen:—In conformity with the City Ordinances I have the honor to submit herewith my report as water commissioner for the year ending November 30, 1901.

Reservoirs.

The keepers in charge of the various reservoirs have kept the buildings and grounds in excellent condition, and many improvements have been made in connection with the same during the year.

In addition to the above work much has been accomplished in the direction of improving the water supply by taking advantage of the low state of the water in the reservoirs during the summer months to clean the shores to the lowest point possible of all stumps, roots and objectionable material which would in any degree have a tendency to discolor or pollute the water.

Holden reservoir No. 2 has been completed, and, with this additional amount of water added to the storage capacity during the winter and spring months, will help meet the demands of the city during the coming season.

A cottage house and barn are in process of construction for the use of the keeper in charge of the reservoirs on this system.

The daily consumption of water has increased far in excess of that warranted by the increase in population, and unless this large consumption or waste can be reduced, immediate measures should be taken to secure an unlimited supply, in order to guard against the danger of a water famine during periods of low rainfall, which frequently occur.

The distribution systems have been extended in thirty-nine streets, making a total of 4.713 miles of pipe added during the year.

Owing to the rapid growth of the city the demand for water main extensions is constantly increasing, and in order to supply the demand large appropriations will be necessary.

Two and seventy-four hundredths miles of old pipe have been taken out and replaced with new pipe of larger size, thereby improving the circulation and fire service in many localities. Much of this work was difficult and of an expensive nature, owing to its being laid in the heart of the city, where there are many car-tracks, sewers, catch-basins, gas-pipes, conduits, etc., encountered, where the work could not be performed as economically or rapidly as in the outlying sections of the city.

The utmost care and fidelity have been exercised during the year to secure the best possible results in all departments of the work, and to improve the pipe systems to the full extent of the means at our disposal.

Recommendations.

That in order to regulate and account for the water furnished all corporations, that no connections be allowed whereby the water from the fire pipes may be delivered into the pipes furnishing the daily supply, unless the entire water service entering their premises is metered.

Fire Hydrants.

Sixty-six (66) fire hydrants have been set during the year. The total number now in service for fire protection is 1829. Of this number 190 are on the premises of individuals and corporations.

Number of water cart hydrants in use,	89
Number of car sprinkling hydrants in use,	39
Number of drinking fountains in use,	9
Number of watering-troughs in use,	18

ELEVATIONS OF RESERVOIRS ABOVE MAIN STREET AT CITY HALL.

Paxton reservoir,	600.49 feet.
Mann reservoir,	498.27 feet.
Lakeside reservoir,	363.11 feet.

LYNDE BROOK RESERVOIR.

Rollway,	340.70 feet.
Top of dam,	344.70 feet.
Bottom of pipe,	303.30 feet.

PARSONS' RESERVOIR.

Rollway,	237.80 feet.
Top of dam,	241.30 feet.
Bottom of pipe,	225.00 feet.

HOLDEN STORAGE RESERVOIR.

Rollway,	269.88 feet.
Top of dam,	274.88 feet.
Bottom of pipe,	239.78 feet.

HOLDEN RESERVOIR NO. 2.

Rollway,	237.80 feet.
Top of dam,	243.30 feet.
Bottom of pipe,	199.00 feet.

HOLDEN DISTRIBUTING RESERVOIR.

Rollway,	177.00 feet.
Top of dam,	182.00 feet.
Bottom of supply pipe,	168.45 feet.
Bottom of waste pipe,	167.75 feet.

Elevation of Main street, at City Hall, above tidewater, 481 feet.

Water pressure at City Hall, low service, 70 pounds.

Water pressure at City Hall, high service, 150 pounds.

In addition to the service pipes, which are reported in tabulated form, there have been thirty-one (31) service pipes changed, for which 383 feet of pipe was used in the streets, and 756 feet on the premises of the owners.

Four thousand, nine hundred and twenty-two (4,922) feet of temporary mains have been laid, the persons thus supplied paying the expense of trenching and laying, and for pipe exceeding 100 feet.

The following tables will show rainfall at the reservoirs, sizes of pipe laid, also number of gates and hydrants set during the year.

TABLE

Showing the daily height of water in LYNDE BROOK RESERVOIR and the rainfall for the year ending November 30, 1901.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	30.08		31.01		26.15		22.35		37.70		38.08		38.12		36.26		36.00		34.00	.59	30.10		28.20	.10
2	30.25		30.85		25.96		22.65	.08	37.66		38.04	.48	38.06		36.17	.14	35.93		34.00		29.88	.84	28.10	
3	30.39		30.70		25.74		22.88	.16	37.62	2.30	38.08		38.03		36.23		35 92		33.93		29.83		27.90	
4	30.51	2.07	30.52		25.58	.84	23.08	.34	38.50	.38	38.02		37.92		36.07	.30	35.90	.12	33.78		29.54		27.85	
5	31.80	.10	30.39		25.40		23.34		38.45		37.94		37.83		36.15	.16	35.86		33.60		29.35	.10	27.63	
6	32.66		30.21		25.23		23.59		38.30	2.02	37.92		37.73		36.17		35.82	.64	33.52		29.28		27.45	
7	32.92		30.00		25.02		23.72		38.85	.16	37.82		37.61	.41	36.17		35.82	.68	33.38		29.26		27.18	
8	33.07		29.90	.12	24.87		23.87		38.68	.04	37.75		37.57		36.19		35.95		33.24		29.25		27.00	
9	33.25		29.70		24.60		24.06	.36	38.38	.12	37.64	.04	37.47		36.19	.15	35 98		33.10		29.08		26.80	
10	33.24		29.60	.43	24.35		24.73	.32	38.26	.03	37.55	.98	37.32		36.17		35.94		32.97		28 85		26.50	
11	33.21		29.50	.60	24.13		25.14	1.97	38.18		37.64		37.21		36.11	1.16	35.83		32.83	.17	28.56		26.32	.13
12	33.16		29.37	.05	23.94		28.53		38.13		37.75		37.12		36.22		35.82		32.77	.12	28.42		26.14	.33
13	33.08		29.27		23.64		29.27		38.05		37.78	.25	37.05		36.22		35.71		32.62	.22	28.22	.90	26.06	
14	32.96		29.16	.06	23.41		29.72	.10	38.04		37.81		36.93		36.22		35.67		32.57		28.22	2.20	25.90	
15	32.81		29.07		23.18		29.97		38.00		37.71		36.85		36.22		35.65		32.44	.35	29.16		25.72	
16	32.67		28.98		22.95		29.97	.02	37.97	.15	37.69		36.75		36.19		35.60		32.34		29.29		25.55	
17	32.56		28.89	.07	22.85		29.90		37.97		37.60		36.75		36.03	.63	35.50	.30	32.16	.67	29.36	.10	25.37	
18	32.40		28.80		22.85		29.88		37.95		37.44	1.27	36.67		36.21		35.40		32.10	.08	29.37		25.17	.08
19	32.30		28.65		22.70		29.92		37.90		37.59	.60	36.56		36.26		35.35	.18	32.00		29.41		25.00	
20	32.13		28.51		22.67		30.03	.30	37.88	.43	37.90		36.54		36.22		35.20	.10	31.86		29.38		24.78	
21	32.01		28.35	.06	22.57		30.32	.95	37.92	.71	38.00		36.47		36.22	.08	35.12		31.72		29.36		24.60	
22	31.87		28.13		22.59		32.45		38.19	.27	38.04	.17	36.40	.55	36.15		35.04		31.58		29.20		24.31	
23	31.72	.32	28.00	.05	22.55	.04	33.25		38.28	.15	38.04		36.51		36.02		34.90		31.40		29.16		24.11	
24	31.70		27.87		22.47		33.72	.31	38.25	1.50	37.90	.83	36.61		35.93	.83	34.80	2.00	31.31		29.07		23.90	1.57
25	31.67		27.72		22.45		34.12	.60	38.52	.62	38.00		36.69		36.00		34.86		31.10		28.95		24.15	
26	31.61		27.59		22.42		34.95	.61	38.58		37.99	.43	36.66		36.00		34.84		30.87		28.97		24.42	
27	31.50		27.42		22.35		36.28		38.35		38.06	1.21	36.58		35.98		34.74		30.65		28.90		24.57	
28	31.40	.11	27.21	.04	22.30		37.17		38.16		38.43	.06	36.54		35.92	.78	34.62		30.50		28.80		24.56	
29	31.28		26.97				37.67		38.10		38.33	.18	36.39		36.00	.03	34.46		30.36	1.00	28.75		24.45	
30	31.18	.24	26.66	.16			37.72		38.04	.38	38.23	.04	36.31		36.03		34.30		30.30		28.55		24.20	
31	31.09		26.40	.08			37.69				38.16				36.03		34.16				28.38			
Totals,		2.84		1.72		.88		6.12		9.26		6.54		.96		4.26		4.02		3.20		4.14		2.21

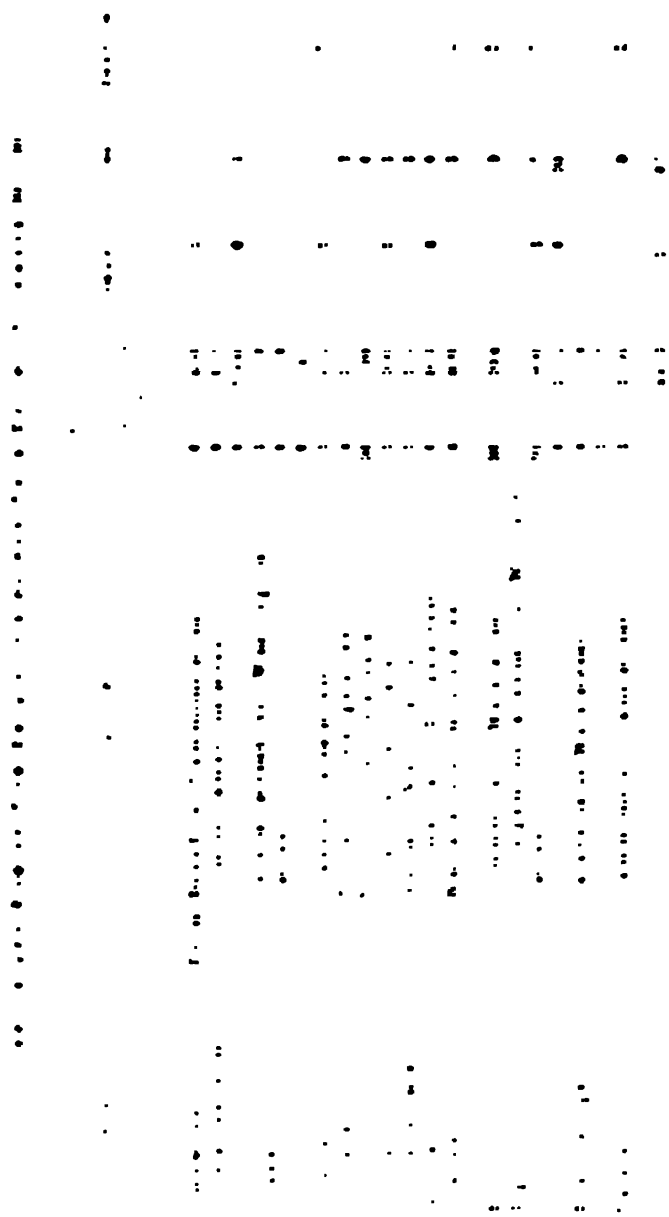
The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway, 37.40 feet. Rainfall for the year ending November 30, 1901, 46.15 inches.



ANNUAL REPORT

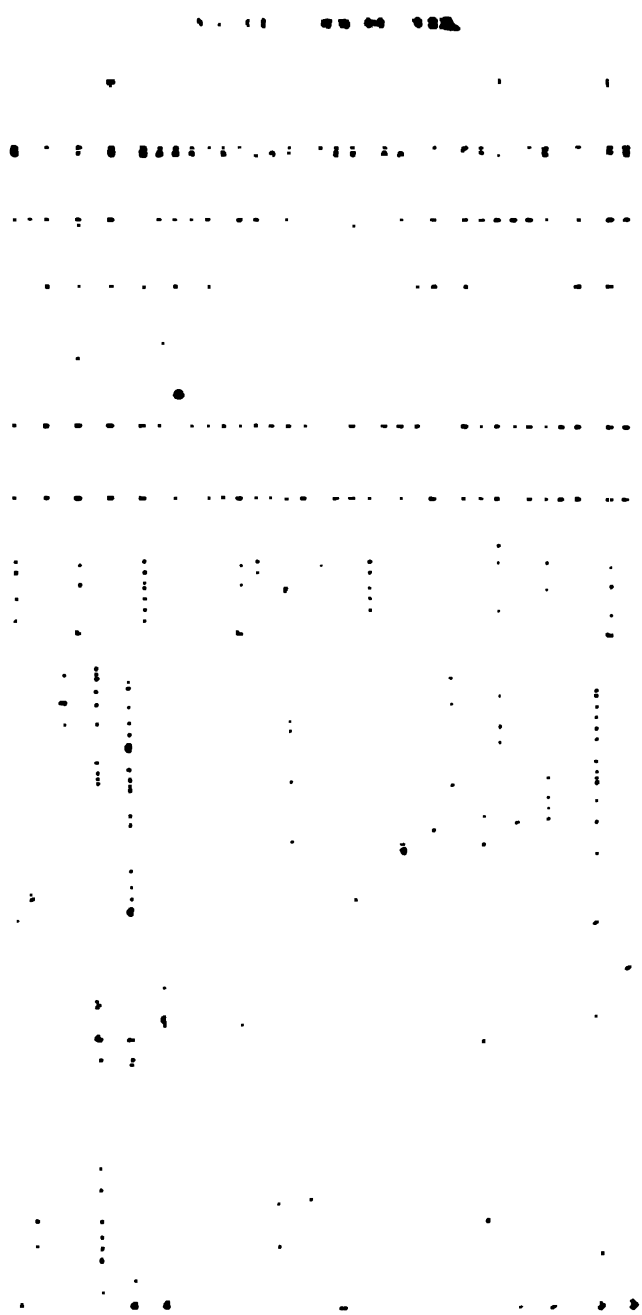
WATER COMMISSIONER.

Massachusetts avenue,	Easterly division from Salisbury street to Drury lane,	6	785		2	H.
Milton,	From terminus of present pipe to Millbrook street,	10	764	1	3	H.
Mott,	" Penn avenue, westerly,	6	278	1		H.
Mount avenue,	" Brooks street, northerly,	8	423	1	1	H.
Orne,	" Windsor to Channing street,	8	377	1	2	L.
Rutland terrace,	" Salisbury to Metcalf,	12	590	2	4	H.
St. James road,	" Beechmont to summit of Bancroft hill,	2	896			H.
So. Ludlow,	" Clover to Keen street,	8	518	1	1	H.
Stowell avenue,	" terminus of present pipe, northerly,	6	210			H.
Vale,	" Ætna street to Union avenue,	6	601	1	2	H.
Waconah road,	" Park avenue, westerly,	8	689	1	2	H.
Watson avenue,	" Barber avenue to Ridgely street,	8	767	1	2	H.
Webster,	" Lyman to Knox street,	14	2862	3	6	L.
Weldon avenue,	" Lochwan avenue, northeasterly,	6	430	1	2	H.
Windsor,	" Washington avenue, northeasterly,	6	250	1	1	H.
			24888	41	54	



Location, Size and Kind of Hydrants Located During the Year Ending November 30, 1901.

Street.	Location.	Kind.	Size.	Size of Connections.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Aberdeen,	369 ft. N. of N. line of Grafton street,	Chapman,	8	8	2½	2	8	115	H.
Adams avenue,	33 ft. E. of E. line of Peterson's house,	"	8	8	2½	2	8	115	H.
Armandale,	Corner of Apricot street,	Florence	8	8	2½	2	40	95	L.
Barber avenue, east,	On E. line of lot 17,	"	8	8	2½	2	10	80	H.
Boardman,	N. of W. Boylston street,	Chapman,	8	8	2½	2	12	100	H.
"	Opposite Hastings avenue,	"	8	8	2½	2	12	95	H.
"	On S. line of Merrill road,	"	8	8	2½	2	12	95	H.
Bremer,	10 ft. W. of Bryant street,	"	4	4	2½	2	10	75	H.
Brooks,	27 ft. W. of W. line of front part of house 5,	"	6	6	2½	2	8	100	H.
Cambridge,	On N. side of Cambridge street, 38 ft. E. of Dorrance street,	Florence,	8	8	2½	2	16	155	H.
Catalpa,	On N. E. corner Catalpa and Bishop streets,	Chapman,	6	6	2½	2	8	35	L.
Eastern avenue,	Opposite No. 173 Eastern avenue,	"	6	6	2½	2	8	90	H.
Fairmont avenue,	On S. line of lot 17,	Florence,	8	8	2½	2	8	100	H.
" "	On S. W. corner Bond street and Fairmont avenue,	"	8	8	2½	2	8	100	H.
Gibbs,	On S. E. corner Weldon avenue and Gibbs street,	"	8	8	2½	2	6	130	H.
Glenwood,	200 ft. W. of Benefit street,	Chapman,	6	6	2½	2	6	60	L
Grafton,	37 ft. W. of W. line of Dundee street,	"	8	8	2½	2	16	65	H.
Green,	At foot of Temple street,	"	8	8	2½	4	18	78	L.
"	At foot of Winter street,	"	8	8	2½	4	18	78	L.
"	5 ft. N. of N. line of Pond street,	"	8	8	2½	4	18	78	L.
"	On N. E. corner of Ash street,	"	8	8	2½	4	18	78	L.
"	On S. line of Spruce street,	"	8	8	2½	4	18	80	L.
"	At 179 Green street,	"	8	8	2½	4	18	85	L.
Greendale avenue.	On W. line of lot 43,	"	8	8	2½	2	12	85	H.
Hamilton,	On W. corner of Fairmont avenue and Hamilton street,	"	8	8	2½	2	16	95	H.
Hillside,	300 ft. W. of Vernon street,	"	4	4	2½	2	6	105	L.
Holland road,	On N. line of school-house lot,	"	6	6	2½	2	12	120	H.
Illinois,	On corner of Leonard and Illinois streets,	"	8	8	2½	2	12	80	L.
Institute road,	56 ft. W. of W. line of house 45,	"	6	6	2½	2	8	68	L.
Keen,	Opposite 2 Keen street,	"	4	4	2½	2	8	115	H.
"	On corner of Prentice and Keen streets,	"	4	4	2½	2	8	110	H.



TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1901.

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1901,	9,316	98	78,146	244,537	190,258	16,804	160,180	10,794	104,910	500	29,526	27,859	21,171	6,134	15,743	173.474	1,763	2,432
Laid in 1901,	1,001			4,615	8,457	1,424	3,030	2,862	3,499							4.713	65	151
Total feet,	10,317	98	78,146	249,152	198,715	18,228	163,210	13,656	108,409	500	29,526	27,859	21,171	6,134	15,743			
Total Miles,	1.953	.018	14.8	47.187	37.635	3.452	30.91	2.586	20.532	.094	5.592	5.276	4.01	1.161	2.981	178.187	1,828	2,583

TABLE

Showing the daily height of water in HOLDEN RESERVOIR and the rainfall for the year ending November 30, 1901.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	22.20		27.07		26.25		24.05	.05	29.64		30.40	.26	30.20		29.15		27.15		25.45	.57	23.50		22.90	.15
2	22.70		27.06		26.10		24.00	.12	29.45		30.40	.01	29.65	.01	29.06	.04	27.05		25.45	.16	23.45		22.83	
3	23.00		27.05		26.00		23.95		29.50	1.70	30.40	.46	29.55		28.95		26.95	.12	25.42		23.50	.82	22.79	
4	24.00		27.04		25.90	.94	23.90	.21	30.70	.79	30.40		29.60	.01	28.90		26.88	.11	25.37		23.45		22.74	
5	25.10		27.04		25.85	.37	23.95	.43	30.70	.06	30.35		29.70		28.80	.19	26.80		25.25		23.40		22.72	
6	25.70		27.03		25.80		23.90		30.30	.07	30.30		29.73		28.74	.36	26 74		25.15		23.40	.16	22.61	
7	25.85		27.00	.03	25.75		23.90		31.00	2.26	30.35		29.77		28.65	.03	26.75	1.44	25.10		23.30		22.59	
8	25.95		26.95		25.70		23.85		31.45	.10	30.40		29.90	.41	28.60		26.85		25.00		23.20		22.52	
9	26.10		26.90	.04	25.65		23.85	.15	30.70	.17	30.45		29.95		28.50	.24	26.85		24.90		23.10		22.48	
10	26.20		26.90	.35	25.60		24.05	.25	30.20	.04	30.50	.28	29.95		28.45		26.76		24.80		23.05		22.43	
11	26.30		26.90	.34	25.50		24.45	2.34	29.30		30.75	.74	29.96		28.40	.65	26.65	.06	24.70	.18	22.85		22.30	
12	26.40		26.90	.44	25.40		25.75		29.50		31.08		29.97		28.40	.35	26.60		24.65	.16	22.70		22.31	.46
13	26.50		26.90		25.30		26.00		29.65		31.03	.28	29.97		28.37		26.55		24.60	.07	22.70	.11	22.33	.08
14	26.55		26 85		25.20		26.25	.12	29.65		30.90		29.93		28.32		26.45		24.55		22.65	3.12	22.34	.01
15	26.65		26.80	.11	25.14		26.35	.01	29.72		30.85		29.89		28.28		26.35	.02	24.45	.04	23 00	.40	22.33	.04
16	26.70		26.80	.04	25.10		26.45	.05	29.80	.23	30.65		29.87		28.13		26.25		24.35	.35	23.55		22.27	
17	26.70		26.80		25.00	.01	26.50		30.00		30.40		29.87		28.05	.62	26.18		24.35	.95	23.60	.14	22.22	
18	26.70		26.80	.09	24.90		26.30		30.00		30.40	.67	29.80		28.05		26.10	.23	24.35	.03	23.60	.04	22.18	
19	26.70		26.75		24 80		26.75		30.00		30.75	.95	29.75		27.95		26.00		24.35	.08	23.55		22.12	.05
20	26.70		26.75		24.70		26.90		30.04	.09	31.00	.29	29.67		27.85		25.95	.16	24.25		23.50		22.07	.04
21	26.70		26.70		24.60		27.40	1.35	30.25	1.30	31.15	.01	29.65		27.75		25.90	.09	24.15		23.53		22.04	
22	26.70		26.66	.06	24.55		28.90	.07	30.50	.51	31.20		29.59	.43	27.68	.50	25.85		24.10		23.48		22.02	
23	26.75		26.65		24.50	.10	29.35		30.45	.16	31.20	.22	29.65	.55	27.60		25.75		24.05		23.45		21.98	
24	26.80	.54	26.60	.06	24.45	.10	29.70		30.08	.66	31.16	.27	29.65		27.48		25.65		23.92		23.43		21.93	.97
25	26.90		26.60		24.35		30.10	.18	30.40	1.54	31.34	.75	29.63	.01	27.45	1.01	25.90	2.21	23.85		23.35		22.15	1.25
26	26.95		26.55		24.25		30.90	.84	31.00	.06	31.10		29.56		27.38		25.95		23.75		23.20		22.30	.08
27	27.00		26.50		24.15		31.75	.28	31.05		31.60	.89	29.48		27.27		25.90		23 65		23.13		21.45	
28	27.02	1.00	26.45		24.10		31.40		30.40		31.91	.94	29.40		27.20	.06	25.80		23.60		23.07			
29	27.04		26.35	.05			31.28		30.00		31.68	.04	29.33		27.30	1.29	25.70		23.55	.77	23.05			
30	27.05		26.30				31.00		30.20	.12	31.20	.20	29.25		27.30	.03	25.62		23.55	.13	23.00			
31	27.06	.40	26.25	.28			30.25				30.70				27.22		25.54				22.95			
Totals,		1.94		1.89		1.52		6.45		9.86		7.26		1.42		5.37		4.44		3.49		4.79		3.13

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway, 30.10 feet.
Rainfall for year ending November 30, 1901, 51.56 inches.

LENGTH AND SIZE OF NEW PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1900.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		Size in Inches.	Length in Feet.			
Aberdeen,	From Grafton street, northerly,	8	422	1	1	H.
Adams avenue,	" Barber avenue, easterly,	8	484	1		H.
Barber avenue, east,	" end of pipe, easterly,	10	360	1		H.
Boardman,	" W. Boylston to Merrill road,	12	1078	3		H.
Bremer,	" Dryden street, easterly,	10	300	1	1	H.
Brooks,	" Central avenue to Mount avenue,	8	537	1	1	H.
Catalpa,	" Montague street, westerly,	8	596	1	1	L.
Clover,	" James to Ludlow street,	8	320		1	H.
Crerie avenue,	" Holt avenue to Barber avenue,	8	247			H.
Eastern avenue,	" Catharine street, north,	8	348	1	1	H.
Fairmont avenue,	" Hamilton to Bond street,	8	513	2	1	H.
Fiske,	" terminus of present pipe to Hadwen road,	2	105			L.
Gibbs,	" Lochwan avenue to Weldon avenue,	6	697	1	2	H.
Grafton,	" Rice square, southeasterly,	16	1211	1	3	H.
Greendale avenue,	" end of pipe easterly,	12	570	1	1	H.
Hamilton,	" Plantation street, easterly,	16	1088	1		H.
		6	450			
Hillside,	" Vernon street, westerly,	6	480	1		H.
Holland road,	" Main street, northerly,	12	792	1	1	H.
Holt avenue,	" terminus of present pipe to Crerie avenue,	8	118		1	H.
Institute road,	" Boynton to West street,	8	695	1	2	L.
Keen,	" So. Ludlow to Prentice,	8	727	2	3	H.
Knox,	" Webster, northwesterly,	8	676	1	1	L.
Lakeside avenue,	" end of pipe northeasterly,	16	1200	3	3	L.
Lochwan avenue,	" Ballard to Gibbs,	6	434	1	2	H.

Massachusetts avenue,	Easterly division from Salisbury street to Drury lane,	6	785		2	H.
Milton,	From terminus of present pipe to Millbrook street,	10	764	1	3	H.
Mott,	" Penn avenue, westerly,	6	278	1		H.
Mount avenue,	" Brooks street, northerly,	8	423	1	1	H.
Orne,	" Windsor to Channing street,	8	377	1	2	L.
Rutland terrace,	" Salisbury to Metcalf,	12	590	2	4	H.
St. James road,	" Beechmont to summit of Bancroft hill,	2	896			H.
So. Ludlow,	" Clover to Keen street,	8	518	1	1	H.
Stowell avenue,	" terminus of present pipe, northerly,	6	210			H.
Vale,	" Ætna street to Union avenue,	6	601	1	2	H.
Waconah road,	" Park avenue, westerly,	8	689	1	2	H.
Watson avenue,	" Barber avenue to Ridgely street,	8	767	1	2	H.
Webster,	" Lyman to Knox street,	14	2862	3	6	L.
Weldon avenue,	" Lochwan avenue, northeasterly,	6	430	1	2	H.
Windsor,	" Washington avenue, northeasterly,	6	250	1	1	H.
			24888	41	54	

LENGTH AND SIZE OF PIPE RELAID DURING THE YEAR ENDING NOVEMBER 30, 1901.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		Size in Inches.	Length in Feet.			
Glenwood,	From Benefit to Hammond street.	6	450	1	1	L.
Gold street court,	" Gold to Lamartine street,	8	850		1	L.
Green,	" Vernon street to Washington street,	18	2000	6	15	L.
		12	19			
		8	78			
		6	41			
Illinois,	" Grand to Gates street,	12	523	1		L.
Madison,	" Portland to Orange street,	14	371		2	L.
Main,	" School to Lincoln square,	36	799		6	L.
Maple,	" Main to Maple terrace,	12	300	1	2	L.
Maple terrace,	" Maple to Walnut street,	12	255		2	L.
Mechanic,	" Commercial to Bridge street,	16	985	4	8	L.
Orange,	" Madison to Plymouth street,	14	400		2	L.
School,	" Commercial to Main street,	36	394		3	L.
Sigel,	" Quinsigamond avenue to Millbury street,	20	1400	2	7	L.
Southbridge,	" Lafayette to Main street,	16	3132	6	39	L.
		14	154			
		12	102			
Tainter,	" Hammond to Grand street,	12	2220		9	L.
			14473	21	97	

Location, Size and Kind of Hydrants Located During the Year Ending November 30, 1901.

Street.	Location.	Kind.	Size.	Size of Connections.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Aberdeen,	369 ft. N. of N. line of Grafton street,	Chapman,	8	8	2½	2	8	115	H.
Adams avenue,	33 ft. E. of E. line of Peterson's house,	"	8	8	2½	2	8	115	H.
Armandale,	Corner of Apricot street,	Florence	8	8	2½	2	40	95	Li.
Barber avenue, east,	On E. line of lot 17,	"	8	8	2½	2	10	80	H.
Boardman,	N. of W. Boylston street,	Chapman,	8	8	2½	2	12	100	H.
"	Opposite Hastings avenue,	"	8	8	2½	2	12	95	H.
"	On S. line of Merrill road,	"	8	8	2½	2	12	95	H.
Bremer,	10 ft. W. of Bryant street,	"	4	4	2½	2	10	75	H.
Brooks,	27 ft. W. of W. line of front part of house 5,	"	6	6	2½	2	8	100	H.
Cambridge,	On N. side of Cambridge street, 38 ft. E. of Dorrance street,	Florence,	8	8	2½	2	16	155	H.
Catalpa,	On N. E. corner Catalpa and Bishop streets,	Chapman,	6	6	2½	2	8	35	Li.
Eastern avenue,	Opposite No. 173 Eastern avenue,	"	6	6	2½	2	8	90	H.
Fairmont avenue,	On S. line of lot 17,	Florence,	8	8	2½	2	8	100	H.
" "	On S. W. corner Bond street and Fairmont avenue,	"	8	8	2½	2	8	100	H.
Gibbs,	On S. E. corner Weldon avenue and Gibbs street,	"	8	8	2½	2	6	130	H.
Glenwood,	200 ft. W. of Benefit street,	Chapman,	6	6	2½	2	6	60	Li.
Grafton,	37 ft. W. of W. line of Dundee street,	"	8	8	2½	2	16	65	H.
Green,	At foot of Temple street,	"	8	8	2½	4	18	78	Li.
"	At foot of Winter street,	"	8	8	2½	4	18	78	Li.
"	5 ft. N. of N. line of Pond street,	"	8	8	2½	4	18	78	Li.
"	On N. E. corner of Ash street,	"	8	8	2½	4	18	78	Li.
"	On S. line of Spruce street,	"	8	8	2½	4	18	80	Li.
"	At 179 Green street,	"	8	8	2½	4	18	85	Li.
Greendale avenue.	On W. line of lot 43,	"	8	8	2½	2	12	85	H.
Hamilton,	On W. corner of Fairmont avenue and Hamilton street,	"	8	8	2½	2	16	95	H.
Hillside,	300 ft. W. of Vernon street,	"	4	4	2½	2	6	105	Li.
Holland road,	On N. line of school-house lot,	"	6	6	2½	2	12	120	H.
Illinois,	On corner of Leonard and Illinois streets,	"	8	8	2½	2	12	80	Li.
Institute road,	56 ft. W. of W. line of house 45,	"	6	6	2½	2	8	68	Li.
Keen,	Opposite 2 Keen street,	"	4	4	2½	2	8	115	H.
"	On corner of Prentice and Keen streets,	"	4	4	2½	2	8	110	H.

Knox,	On E. line of lot 13,	Chapman,	6	6	2½	2	8	60	L.
Lakeside avenue,	3 ft. N. of S. line of Walker's ice-house,	"	8	8	2½	4	16	70	L.
" "	42 ft. S. of N. line of Walker's ice-house,	"	8	8	2½	4	16	70	L.
" "	50 ft. N. of N. line of 1st dwelling-house S. of ice-house,	Florence,	8	8	2½	2	16	70	L.
Lochwan avenue,	On N. W. corner Gibbs street and Lochwan avenue,	"	8	8	2½	2	6	130	H.
Maple,	On S. E. corner Maple street and Maple terrace,	Chapman,	8	8	2½	4	12	60	L.
Mechanic,	At Bigelow court,	"	8	8	2½	4	16	80	L.
"	At foot of Union street,	"	8	8	2½	4	16	80	L.
"	On E. line of Spring street,	"	8	8	2½	4	16	80	L.
"	42 ft. W. of Tremont street,	"	8	8	2½	4	16	75	L.
Millbury,	On E. side of Perry court,	"	4	4	2½	2	4	160	H.
Milton,	25 ft. W. of Millbrook street,	Florence,	8	8	2½	2	10	120	H.
Mott,	100 ft. E. of E. line of Coral street,	Chapman,	4	4	2½	2	6	95	H.
Mount avenue,	On N. line of lot 13,	"	6	6	2½	2	8	80	H.
Orne,	On N. E. corner Channing and Orne streets,	Florence,	8	8	2½	2	8	45	H.
Rutland terrace,	21 ft. N. of N. line of Metcalf street,	Chapman,	8	8	2½	2	12	100	H.
" "	217 ft. S. of S. line of Salisbury street,	Florence,	8	8	2½	2	12	100	H.
Sigel,	On E. line of lot 14,	"	8	8	2½	2	20	90	L.
"	On E. line of Bigelow street,	"	8	8	2½	2	20	90	L.
Southbridge,	At 208 Southbridge street,	Chapman,	8	8	2½	2	16	85	L.
"	On S. line of Salem street,	"	8	8	2½	2	16	80	L.
"	20 ft. S. of S. line of No. 140,	"	8	8	2½	2	16	80	L.
"	At 70 Southbridge street,	"	8	8	2½	4	16	78	L.
"	At corner Southbridge and Myrtle streets,	"	8		2½	4	16	75	L.
"	At corner Southbridge street and Burnside court,	"	8	8	2½	4	16	75	L.
So. Ludlow,	On N. E. corner So. Ludlow and Clover streets,	"	6	6	2½	2	8	120	H.
Vale,	On N. W. corner Vale street and Union avenue,	Philadelphia	6	6	2½	2	6	50	H.
Waconah road,	300 ft. W. of W. line of Park avenue,	Chapman,	8	8	2½	2	8	110	H.
Watson avenue,	On N. E. corner of avenue,	Florence,	8	8	2½	2	8	70	H.
Webster,	On S. line of C. S. Bancroft's house,	Chapman,	6	6	2½	2	14	68	L.
"	Opposite Hope avenue,	"	6	6	2½	2	14	72	L.
"	On N. line of Knox street,	"	6	6	2½	2	14	70	L.
Weldon avenue,	On N. W. corner Weldon avenue and unnamed street,	Florence,	8	8	2½	2	6	120	H.
Windsor,	Opposite 66 Windsor,	"	8	8	2½	2	6	68	H.

TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1901.

	2''	3''	4''	6''	8''	10''	12''	14''	16''	18''	20''	24''	30''	36''	40''	Miles.	Hydrants.	Gates.
Prior to 1901,	9,316	98	78,146	244,537	190,258	16,804	160,180	10,794	104,910	500	29,526	27,859	21,171	6,134	15,743	173.474	1,763	2,432
Laid in 1901,	1,001			4,615	8,457	1,424	3,030	2,862	3,499							4.713	65	151
Total feet,	10,317	98	78,146	249,152	198,715	18,228	163,210	13,656	108,409	500	29,526	27,859	21,171	6,134	15,743			
Total Miles,	1.953	.018	14.8	47.187	37.635	3.452	30.91	2.586	20.532	.094	5.592	5.276	4.01	1.161	2.981	178.187	1,828	2,583

SERVICE PIPES LAID TO NOVEMBER 30, 1901.

	In the Street.		Premises of Individuals.		No.
	Feet.	Miles.	Feet.	Miles.	
Prior to 1887	171,603.36	32.498	188,386.48	35.676	7,629
1887	9,674.	1.832	11,418.25	2.162	469
1888	8,814.75	1.669	13,872.	2.627	431
1889	10,021.75	1.898	11,264.5	2.133	472
1890	9,300.58	1.761	13,972.9	2.644	449
1891	9,307.5	1.762	14,276.66	2.704	483
1892	10,012.58	1.896	12,803.25	2.424	506
1893	8,616.25	1.631	11,064.	2.095	430
1894	7,218.	1.367	11,035.	2.09	366
1895	7,469.	1.414	12,407.	2.35	366
1896	7,067.83	1.34	8,796.	1.66	346
1897	3,324.11	1.576	9,805.2	1.857	383
1898	7,291.	1.38	12,878.75	2.439	342
1899	7,234.25	1.37	12,134.	2.298	336
1900	6,047.25	1.126	8,241.50	1.56	284
1901	6,506.75	1.232	7,291.25	1.38	315
	294,508.96	55.752	359,646.74	68.099	13,607

WATER-CART HYDRANTS.

Benefit,	26′ 6′ out from stand pipe, 59′ 7″ E. of E. line of Beacon St., 15′ 10″ S. of N. line of street.
Bloomingdale Road,	22′ out from stand pipe, 104′ E. of E. line of Grafton St. (S.), 15′ 9″ N. of S. line of road.
" "	7′ 8″ out from stand pipe.
Bowdoin,	5′ N. of stand pipe, 13′ E. of E. line of Chestnut St. [(S.).
Bridge,	20′ 4″ out from stand pipe, 36′ 6″ W. of W. line of Viaduct Wall
Burncoat,	21′ E. of W. line of street, 18′ 9″ N. of N. line of Melville St.
Cambridge,	12′ 6″ S. of N. line of street, 3′ 6″ E. of W. line of Southbridge St.
"	11′ 6″ out from stand pipe. [St.
"	3″ valve, 16′ 9″ S. of N. line of street, 25′ E. of E. line of Douglas
" cor Douglas.	¾ plug stop, 15′ S. of N. line of street, 25′ E. of E. line of Douglas St.
Carroll,	7′ out from stand pipe.
Chandler,	20′ 9″ out from stand pipe, 43′ 6″ W. of W. line of Newbury St.
" near Park Ave.,	7′ 3″ out from stand pipe, 30′ W. of W. line of Park Ave.
" " Bellevue,	24′ 8″ N. of stand pipe, 16′ E. of W. line of Wright's new machine shop.
Chatham,	12′ out from stand pipe, 75′ 6″ E. of E. line of Houchin Ave.
Crown,	4′ 4″ out from stand pipe.
Florence,	3″ valve, 8′ 7″ out from stand pipe.
"	25′ N. of N. line of Charlotte St., 16′ E. of W. line of Florence St.
Foster,	12′ 8″ out from stand pipe.
Front,	64′ N. of stand pipe, 63′ 7″ W. of W. line of Church St.
Garden,	23′ 9″ out from stand pipe, 54′ 3″ W. of W. line of Lincoln St., 19′ 6″ N. of S. line of Garden St.
Grand,	5′ 9″ out from stand pipe at main pipe, 26′ 6″ out from stand pipe, 16′ 6″ E. of E. line of Illinois St.
Green,	14′ 4″ out from stand pipe, 27′ 8″ N. of S. line of Crompton Shop.
Grove,	34′ 3″ out from stand pipe, 49′ S. of S. line of Lexington St.
" end of wire mill,	7′ 9″ out from stand pipe.
" near North St.	8′ 6″ out from stand pipe.
Hermon,	8′ 10″ S. of stand pipe, 14′ 4″ from S. line of barn wall on N. W. corner Southbridge and Hermon Sts., 30′ 2″ W. of E. line of barn.
"	9′ 6″ S. of N. line of Hermon St., 27′ E. of E. line of Main St.
Highland,	7′ 9″ out from stand pipe.
"	10′ 3″ S. of stand pipe, 14′ W. of W. line of Boynton St.
"	22′ 9″ out from stand pipe, 43′ E. of E. line of Westland St.
"	31′ 6″ out from stand pipe.
" near Newton Sq.,	2″ valve at main, 32′ 6″ out from stand pipe, 1′ 6″ E. of center of stand pipe.
	2″ drip valve to above stand pipe, 7′ out from stand pipe.
King,	24′ out from stand pipe, 17′ W. of W. line of Queen St. [St.
"	¾ stop, 22′ 3″ out from stand pipe, 17′ 9″ W. of W. line of Queen
"	7′ 10″ out from stand pipe. [amond Ave.
Lafayette,	3″ valve, 13′ S. of N. line of street, 31′ W. of W. line of Quinsig-
"	¾″ stop, 11′ 2″ S. of N. line of street, 32′ W. of W. line of Quinsig- amond Ave.
Lagran e,	20′ out from stand pipe, 50′ S. of S. line of Beacon St.
Lake,	19′ 9″ out from stand pipe.
Lancaster,	27′ out from stand pipe, 14′ S. of S. line of Institute Rd. [Lincoln.
Lincoln,	14′ out from stand pipe, 10′ 9″ N. of N. line of Perkins St., W. of
Lodi,	4′ 3″ out from stand pipe.
Madison,	22′ 8″ out from stand pipe, 7′ 2″ W. of W. line of Southbridge St.
Main,	At Hammond St., 7′ W. of stand pipe.
"	22′ 9″ W. of E. line of Main St., 35′ N. of N. line of Gertrude Ave.
" near rand,	34′ N. of N. line of Downing St., 53′ E. of W. line of Main St., 3′ 6″ W. of stand pipe.
" opp. Marble,	6′ 3″ out from stand pipe.
" near Park,	25′ S. of stand pipe on branch of 2-way hydrant, 1′ 8″ W. of E. line of curb-stone, 11′ 7″ N. of N. line of Park St.
" " Univ. Park,	2′ 10″ out from stand pipe, 9″ N. of stand pipe.
Mill,	27′ out from stand pipe, 13′ 6″ N. of N. line of Quinn's block.
Millbury, near the mill	2′ out from stand pipe, 1′ 9″ W. of stand pipe.
" near Seymour,	10′ W. of E. line of street, 13′ 9″ S. of N. line of Seymour St.
" " Greenwood,	6″ N. of stand pipe.
" below ledge,	2′ 6′ N. of stand pipe.
" S. of Cambridge,	13′ 2″ W. of E. line of street, 62′ 9″ N. of N. line of Whitney St., 2nd box 1′ 6″ out from stand pipe.
Merrick,	107′ S. of S. line of Davis Ct., 7′ out from stand pipe.
Mulberry,	22′ 6″ out from stand pipe, 15′ E. of W. line of St., 27′ 3″ N. of N. line of Asylum St.
Oak Ave.,	18′ 9″ E. of W. line of avenue, 26′ N. of N. line of Belmont St. (W.).

WATER-CART HYDRANTS (*continued*).

Orient.	3″ valve, 21′ N. of N. line of Hamilton St., 18′ 8″ E. of W. line of Orient St.
"	¾ stop, 17′ 6″ E. of W. line of street, 22′ 3″ N. of N. line of Hamilton St.
Oxford,	15′ S. of S. line of Pleasant St., 8′ out from stand pipe.
Paine, near Perkins,	8′ out from stand pipe.
" " Vinton,	9′ 6″ out from stand pipe.
Park Ave.,	Box on Lovell St., 28′ 3″ S. of stand pipe, 12′ E. of W. line of Park Ave.
" "	7′ out from stand pipe.
Penn Ave.,	15′ 9″ E. of W. line of avenue, 20′ 4″ S. of S. line of avenue.
Piedmont,	22′ out from stand pipe, 33′ 6″ N. of N. line of Brigham St.
P antation,	26′ 4″ N. W. from stand pipe, 13′ 8″ N. of N. line of Shrewsbury St., 9′ 8″ W. of E. stone wall cor. Shrewsbury and Plantation Sts.
Prescott,	2′ 6″ out from stand pipe.
" above wire mill,	9′ 10″ out from stand pipe.
Richards,	8′ out from stand pipe.
Salisbury,	18′ 6″ W. of W. line of Dean St., 7′ out from stand pipe.
" cor. Park Ave.,	8′ 10″ out from stand pipe.
Sheridan,	Box on Shrewsbury 27′ N. of S. line of street, 12′ E. of W. line of Sheridan St.
Shrewsbury,	12′ 3″ N. of S. line of Shrewsbury St., 18′ W. of W. line of school-house fence.
Southbridge, near P. & W. R.R.,	9′ 3″ out from stand pipe.
Southgate,	24′ 6″ out from stand pipe, 26′ 9″ W. of W. line of Southbridge St.
Summer,	17′ 3″ E. of W. line of street, 66′ 6″ S. of S. line of Central St.
Tainter and Kilby,	21′ 6″ out from stand pipe, 23′ 6″ W. of W. line of Tainter St.
Temple,	29′ 8″ S. of N. line of street, 22′ 10″ E. of W. line of Jourdan's barn.
Vernon,	10′ 6″ out from stand pipe, 21′ 9″ E. of E. line of Richland St.
Ward,	3′ 6″ out from stand pipe.
"	17′ 6″ out from stand pipe, 19′ 6″ W. of W. line of Wade St.
Washington,	3″ valve 21′ N. of N. line of Plymouth St., 15′ 10″ W. of E. line of Washington St.
"	¾ stop, 21′ 6″ N. of N. line of Plymouth St., 17′ 6″ W. of E. line of Plymouth St.
Water,	19′ 3″ out from stand pipe.
Westminster,	8′ 9″ out from stand pipe.
William,	7′ 6″ out from stand pipe.
"	7′ out from stand pipe.
Winslow,	7′ 3″ out from stand pipe.
	22′ out from stand pipe, 15′ 9″ S. of S. line of Pleasant St., E. of Winslow St.
Woodland,	6′ 10″ out from stand pipe, 12′ 10″ N. of S. line of school-house lot.

CAR-SPRINKLING HYDRANTS.

Belmont,	22′ 6″ S. of N. line of street, 36′ W. of W. line of Oak Ave.
Boynton,	17′ 4″ E. of W. line of street, 39′ N. of N. line of Highland St.
Burncoat,	14′ 6″ E. of W. line of street, 94′ S. of S. line of engine-house.
Franklin Sq.,	35′ W. of E. line of Main St., 14′ N. of S. line of Allen Ct.
Fremont,	21′ 6″ S. of N. line of street, 74′ E. of E. line of house 22.
Grafton,	22′ N. of S. line of street, 1′ E. of E. line of Houghton St.
"	51′ 4″ W. of E. line of Grafton St., 14′ S. of N. line of Keese St.
Grove, near North,	29′ S. of S. line of North St., 17′ 6″ W. of E. line of Grove St.
Highland,	12′ 4″ S. of N. line of street, 14′ W. of W. line of 162 Highland St.
June,	17′ W. of E. line of June St., 56′ N. of N. line of Chandler St., looking west.
Lincoln,	24′ W. of E. line of street, 14′ 2″ S. of N. line of Perkins St.
Main,	16′ 7″ W. of E. line of street, 11′ 3″ N. of N. line of Beaver St.
"	39′ 4″ N. of S. line of street, 88′ W. of W. line of McMullen lot 14.
"	20′ S. of N. line of Main St., 86′ 6″ E. of E. line of Lake St.
"	31′ N. of S. line of street, 51′ 6″ W. of W. line of L part of house 1482 Main St.
"	19′ W. of E. line of street, 23′ S. of S. line of Hammond St.
Mill,	18′ W. of E. line of street, 31′ N. of N. line of Main St.
Millbury,	North of Sigel St. 6″ gate on hydrant will shut this off.
"	26′ W. of E. line of street, 10′ N. of S. line of Maxwell St.
"	11′ 6″ W. of W. line of street, 15′ S. of N. line of Perry St.
Park Ave.,	21′ W. of E. line of Park Ave., 76′ S. of S. line of Fern St.
" "	23′ 8″ W. of E. line of Park Ave., 39′ N. of S. line of Harrington & Richardson shop.
Pleasant,	15′ S. of N. line of street, 9′ 6″ E. of W. line of 137 Pleasant St.
"	19′ 6″ S. of N. line of street, 32′ 9″ W. of W. line of Park Ave.
"	20′ S of N. line of street, 151′ W. of W. line of 414 Pleasant St.
"	3″ valve, 18′ W. of E. line of Pleasant St., 3′ 6″ S. of N. line of Wetherell's farm house.
Providence,	107′ S. of N. line of S. pier to Crompton's driveway, 20′ 3″ E. of W. line of Providence St.
Salem,	34′ 6″ S. of S. line of Front St., 26′ 6″ W. of E. line of Salem Sq.
Salisbury,	19′ W. of E. line of street, 23′ 8″ N. of N. line of Lincoln Sq. This gate shut to the right.
"	3″ valve, 36′ 6″ E. of E. line of Park Ave., 19′ S. of N. line of Salisbury St.
Shrewsbury,	115′ S. of N. line of Hunt St., 20′ W. of E line of Shrewsbury St.
Southbridge,	426′ 6″ S. of N. line of Lafayette St., 17′ 6″ W. of E. line of Southbridge St.
Summer,	17′ E. of W. line of street, 29′ S. of S. line of Prospect St.
Vernon,	18′ 8″ W. of E. line of street, 24′ S. of S. line of Union Ave., looking west.
Washington Sq.,	43′ 6″ W. of W. line of Summer St., 40′ 8″ N. of S. line of Front St.
Webster,	3′ 8″ E, of E. line of street., 9′ 2″ N. of S. line of Jacques St.
W. Boylston, near fair grounds,	3″ valve, 1′ S. of S. rail in center of turn-out near fair grounds.
W. Boylston, near Huntington Ave.,	3″ valve, 16′ W. of E. line of W. Boylston St., 52′ S. of S. line of Huntington Ave.

DRINKING-FOUNTAINS.

Belmont, cor. Plantation,	24′ E. of W. line of Plantation St., 3′ 4″ N. of S. line of Belmont St.
Cambridge Sq.,	On Millbury St., 30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge.
Franklin Sq.,	14′ 3″ E. of E. line of Scott's block, 20′ 3″ N. of N line of same.
Front, cor. Salem Sq.,	65′ 6″ from base of fountain, 42′ 9″ W. of W. line of Church.
" " Summer,	On Summer, 26′ E. of W. line of street, 8′ 8″ N. of N. line of Front St.
Lincoln Sq., cor Main,	Shut off in sidewalk.
Millbury, cor. Reeves,	1′ 6″ W. of W. line of Millbury St., 27′ 9″ S. of N. line of Reeves St.
Vernon Sq.,	22′ 4″ S. of N. line of Vernon St., 8′ S. of N. line of house, 108 Water St., 8′ E. of W. line of Water St.
Webster Sq.,	30′ 9″ N. of S. line of Cambridge St., 25′ 6″ W. of W. line of Webster St.

WATERING-TROUGHS.

Adams Sq.,	20′ W. of E. line of Lincoln St., on S. line of Shattuck St.
Belmont, at Lake,	11′ 6″ S. of S. line of Belmont St., 34′ 7″ E. of W. line of Lake Ave.
Chadwick Sq.,	29′ S. of hydrant, 35′ 6″ E. from watering trough. [St. (W.).
Chandler,	10′ 2″ E. of W. line of Bellevue St., 16′ 8″ S. of N. line of Chandler
Chandler,	31′ 6″ N. of S. line of Chandler St., 6′ 9″ E. of W. line of Mill St.
Coes Sq.,	11′ 4″ W. of E. line of street, 19′ N. of N. end of parapet wall.
	42′ 10″ S. of S. line of Coes' shop, 56′ 8″ S. of S. line of Beaver St.
Grafton, cor. Hamilton,	16′ 5″ S. of N. line of street, 32′ 6″ N. of trough, 100′ 6″ W. of W. line of Orient. [trough.
James,	14′ out from center of trough, ½ rod stop: 11′ 9″ out from center of
Lincoln Sq.,	43′ 8″ S. of N. line of Lincoln Sq., 10′ 3″ W. of W. line of Prescott St.
Millbury,	30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
" at Greenwood,	26′ 4″ directly E. from trough.
Pleasant,	7′ 3″ out from X on trough near the ground. [gate St.
Southbridge,	33′ 2″ trom W. line of Southbridge St., 28′ S. of S. line of South-
" at Madison,	32′ 9″ out from trough at Madison Sq., 32′ 6″ S. of S. line of 114.
" " Stearns Sq.,	6′ 3″ out from trough, 1′ 8″ S. of trough. Drip:—4′ S. of trough, 2′ 6″ W. of E. end of trough.
Vernon Sq.,	On Vernon St., 5′ 6″ above gate-box, 6′ 9″ out in direct line from where it enters the trough. [Summer St.
Washington Sq.,	On Shrewsbury St., 36′ 6″ S. of N. line of street, 60′ E. of E. line of
Webster Sq.,	15′ 9″ W. of W. line of Webster St., 30′ 10″ N. of S. line of Cambridge St.

EXPENDED 1901.

WATER WORKS CONSTRUCTION.

Salary of Commissioner John G. Brady,	$2,000 00
Clerical service,	943 93
Pay-rolls, laborers,	12,321 33
Abatements,	3 00
Advertising,	14 70
Blank books, stationery and stamps,	5 90
Brick, and freight on same,	2 66
Carpentering and lumber,	2 11
Car tickets and transportation of laborers,	60 00
Castings, patterns and fire-clay,	559 21
Cordage, waste and packing,	103 10
Engineers' services and materials,	21 75
Express, freight and trucking,	626 84
Furniture and fixtures for office,	90
Hack and horse hire,	32 00
Hardware, tools and repairs,	214 70
Hydrants, water gates, valves and repairs,	3,718 92
Inspection of pipe,	124 95

Iron pipe, and freight on same,	3,548	89
Iron and steel,	33	34
Lead pipe and lead,	339	95
Meters and repairs,	1,007	51
Meters and repairs, H. A. Desper,	20	00
Meters and repairs, Union Water Meter Company,	5,001	00
Meters taken out,	85	50
New England Telephone & Telegraph Co., rental and service,	1	75
Paints, oils and painting,	12	86
Pipe, fittings, etc.,	2,030	00
Powder and fuse,	2	89
Repairs, streets,	98	63
Rubber goods,	3	75
Service pipe, cement and sand,	45	06
Stone for blocking,	2	00
Stone posts, wall stone and labor,	3	22
Telegrams and telephone tolls,		47
Traveling expenses,	3	52
Machinery,	35	00
Rent and repairs boilers and engines,	46	40
Drinking fountains,	140	00
		$33,217 74

PIPE EXTENSION AND IMPROVEMENT ACCOUNT.

Pay-rolls, laborers,	$10,491	58
Carpentering and lumber,	314	73
Car tickets and transportation of laborers,	15	00
Castings, patterns and fire-clay,	1,252	56
Engineers' services and material,	7	02
Express, freight and trucking,	643	89
Fuel,	15	73
Hack and horse hire,	18	00
Hardware, tools and repairs,	20	00
Hose and couplings,	100	90

Hydrants, water gates, valves and repairs,	1,425 89	
Iron pipe, and freight on same,	15,647 84	
Iron and steel,	3 00	
Lead pipe and lead,	4,194 04	
Paints, oils and painting,	30 20	
Refreshments for laborers,	17 40	
Repairs, sewers,	234 43	
Repairs, streets,	2,354 17	
Sewer pipe, cement and sand,	172 34	
Stone for blocking,	17 83	
Stone posts, wall stone and labor,	137 21	
Testing pipe,	160 62	
Team work,	118 10	
Repairs Millbrook sewer,	135 32	
		37,527 80

HOLDEN SUPPLY.

Pay-rolls, laborers,	$66,395 36	
Advertising,	8 00	
Blank books, stationery and stamps,	26 68	
Brick, and freight on same,	406 69	
Carpentering and lumber,	78 64	
Car tickets and transportation of laborers,	7 50	
Castings, patterns and fire-clay,	1,025 42	
Cordage, waste and packing,	132 66	
Engineers' services and materials,	2,430 37	
Express, freight and trucking,	1,038 99	
Extra labor, sundry persons,	31 18	
Fuel,	550 33	
Hack and horse hire,	836 61	
Hardware, tools and repairs,	381 45	
Hose and couplings,	143 17	
Hydrants, water gates, valves and repairs,	75	
Iron pipe, and freight on same,	41 95	

Iron and steel,	134	80
Lime,	14	00
Miscellaneous supplies,	35	66
New England Telephone & Telegraph Co., rental and service,		45
Paints, oils and painting,	126	98
Photographic supplies,	8	10
Pipe, fittings, etc.,	199	62
Powder and fuse,	1,964	97
Refreshments for laborers,	8	50
Rubber goods,	130	65
Sewer pipe, cement and sand,	12,674	47
Team work,	18,573	06
Stone for gate-house,	19,946	56
Appraisal of land,	5	00
Bricks for gate-house,	53	60
Farrar & Gates, land,	2,851	43
Rent of engines and derricks,	216	44
Tiling for gate-house,	418	00
Grass seed,	12	20
Bridge,	649	44
Gate-house roof,	429	58
		131,989 26

KETTLE BROOK SUPPLY.

Pay-rolls, laborers,	$12,403	88
Blank books, stationery and stamps,	7	95
Carpentering and lumber,	30	88
Cordage, waste and packing,	16	88
Engineers' services and materials,	850	18
Express, freight and trucking,	422	38
Extra labor, sundry persons,	4	44
Extra service, expert engineers,	50	00
Fuel,	41	01
Furniture and fixtures,	28	50
Hack and horse hire,	334	49
Hardware, tools and repairs,	452	85

Hydrants, water gates, valves and repairs,	782	50
Iron pipe, and freight on same,	1,521	01
Iron and steel,	53	15
Land purchased per order Common Council, Nov. 27, 1898,	1,100	00
Legal expenses,	9	90
Lime,	1	25
Miscellaneous supplies,	16	50
Paints, oils and painting,	37	24
Pipe, fittings, etc.,	14	47
Powder and fuse,	60	16
Printing and photographing,	9	65
Recording deeds,	5	15
Seeds, plants, trees, etc.,	58	88
Sewer pipe, cement and sand,	2,054	76
Stone posts, wall stone and labor,	35	00
Telegrams and telephone tolls,	1	10
Repairs, houses,	13	00
Services expert, water cases,	37	00
Team work,	2,425	45
E. Belisle, on contract building barracks,	1,320	00
Boilers and engines,	1,800	00
Machinery, belting and repairs,	141	85
Lead,	114	26
Telephone line,	60	57
		$26,316 29

Value of stock and tools on hand, November 30, 1901, $116,046.25. Bills have been rendered to the city treasurer to the number of 1,483, amounting to $19,291.11.

Number of abatements, 27, amounting to $398.23.

Amount of bills in hands of treasurer November 30, 1901, $2,833.70.

Amount collected during the year, $19,582.55.

Respectfully submitted,

JOHN G. BRADY,
Water Commissioner.

December 16th, 1901.

REPORT OF THE WATER REGISTRAR.

To the Honorable City Council of the City of Worcester.

Gentlemen: In compliance with Section 7, Chapter 48 of the City Ordinances, the report of the income division of the Water Department for the year ending November 30, 1901, is presented.

Three hundred and twenty-seven (327) applications for water were received during the year, and placed in the hands of the water commissioner.

The following bills were given the treasurer for collection:

For metered water,	24,631 bills,	amounting to	$256,948 66
For annual rates,	699 bills,	amounting to	7,931 02
Total bills,	25,330	Total amount,	$264,879 68

Total amount of revenue received during the year ending November 30, 1901, $259,429.06. Of this amount $2,105.98 was from uncollected bills in the hands of the treasurer November 30, 1900.

The amount of uncollected bills in the hands of the treasurer November 30, 1901, was $6,569.32.

During the year the sum of $1,253.99 has been abated owing to changes from annual rates to metered rates, vacant tenements, and adjustment of bills of water takers. $1,676.44 was transferred.

Forty-seven services were shut off for non-payment of bills, and, with four exceptions, were immediately turned on upon payment of bills.

The quantity of metered water furnished during the year ending November 30, 1901, was as follows:

Domestic purposes,	606,226,865 gallons.
Manufacturing purposes,	360,505,200 gallons.
Steam and electric railways,	146,506,986 gallons.

Elevators,	195,404,342 gallons.
Motors,	4,592,548 gallons.
Schools,	23,961,893 gallons.
Churches,	2,925,174 gallons.
Hotels,	12,186,577 gallons.
Hospitals,	56,826,449 gallons.
Stables,	7,703,969 gallons.
Laundries,	14,873,793 gallons.
Fire Department houses,	4,293,883 gallons.
Sewage purification works,	2,859,900 gallons.
Stores, offices, saloons, shops, etc.,	80,902,859 gallons.
Total metered water,	1,519,770,438 gallons.
Unmetered water (estimated),	27,000,000 gallons.
Street sprinkling,	88,744,500 gallons.
Merrifield estate,	4,505,000 gallons.
Total,	1,640,019,938 gallons.

From the two latter amounts, street sprinkling and Merrifield estate, no revenue is received.

Kinds.	Sizes.										
	⅝″	¾″	1″	1½″	2″	3″	4″	6″	8″	10″	Total.
B. and F. Piston,	739	61	..		5						805
Columbia	1					..					1
Crown	13	2				...					15
Desper	428	11		..							439
Duplex	1										1
Empire	1	..									1
Gem	1		1		1	4	5	1		2	15
Hersey	738	44	1	1	2		1	...			787
Hersey disc	355					..	...			...	355
Lambert	6								...	...	6
Nash	5	...		...				...			5
Shedd	2	..									2
Thomson	2		...			...	..			...	2
Torrent			1			1	1	1	..		4
Trident	156			...		...			..		156
Union Rotary	9,136	413	201	160	199	96	24	5	1		10,235
Total	11,584	531	204	161	207	101	31	7	1	2	12,829

The number of new meters set during the year was 353, making the total number now in use 12,829.

During the year 1 Crown, 78 Desper, 116 Hersey, 59 Hersey disc, 1 Lambert, 2 Nash, 92 Piston, 1786 Rotary, 1 Thomson, and 25 Trident meters have been taken off for repairs. Most of them have been repaired at the department shop, and without cost to the owner. Total cost of repairs, $5,018.68.

Ten new elevators have been put in during the past year, making the total 363.

DWELLINGS, PERSONS, FIXTURES, ETC., ASSESSED FOR WATER IN THE CITY OF WORCESTER.

Dwellings,	11,762	Baths,	16,658
Families,	25,176	Water-closets,	31,654
Stores,	1,181	Hose,	6,696
Offices,	1,041	Boilers,	2,702
Saloons,	118	Horses,	5,307
Markets,	83	Cows or oxen,	715
Shops,	503	Elevators,	363
Stables,	1,984	Barber shops,	114
Persons using,	116,064	Hotels,	33
Sinks,	31,353	Schools,	73
Basins,	18,236	Motors,	46

RECEIVED.

For assessments for water, 1900,	$2,105 98	
For assessments for water, 1901,	257,323 08	
Accrued interest,	1,824 00	
Total,		$261,253 06

EXPENDED.

Amount transferred to interest on water loan,	$138,125 00

Amount transferred to sinking fund, per order City Council,	4,500 00	
Running expenses,	50,782 91	
		193,407 91
Balance transferred to sinking fund (water bonds),		$67,845 15

DETAILED ACCOUNT OF EXPENDITURES.

George W. Batchelder, salary,	$1,600 00
Clerical service,	1,607 11
Services of canvassers,	203 25
Service of meter readers,	4,238 59
Care of reservoirs,	1,820 00
Pay-rolls, laborers,	26,425 70
Abatements of water rates,	95 41
Advertising,	15 50
Blacksmithing and blacksmiths' supplies,	314 68
Blank books, stationery, and stamps,	399 72
Blankets, harness and repairs,	209 00
Books and subscriptions,	13 00
Carpentering and lumber,	420 69
Car tickets and transportation of laborers,	217 50
Carts, wagons and repairs,	366 30
Castings, patterns, and fire clay,	525 09
Chemical analyses (water samples),	78 00
Cordage, waste and packing,	57 34
Crusher stone,	1 73
Damage by bursting pipe,	7 00
Engineers' services and materials,	682 27
Express, freight and trucking,	115 50
Expert examination of water pipe,	75 00
Fuel,	323 61
Furniture, fixtures and repairs,	285 50
Gas,	231 00

Gravel, filling, and concrete work,	2 00
Hack and horse hire,	215 50
Hardware, tools and repairs,	666 70
Hay, grain and straw,	1,358 12
Horses,	345 00
Hose and couplings,	25 73
Hydrants, water gates, valves and repairs,	92 25
Insurance,	53 75
Iron pipe, and freight on same,	220 85
Iron and steel,	193 51
Laundry work,	4 18
Lead pipe and lead,	12 63
Loam, fertilizer and seeds,	42 50
Medical attendance on horses,	40 00
Meters and repairs,	320 04
Meters and repairs (Union Water Meter Company),	1,475 43
Meters taken out,	20 50
Miscellaneous supplies,	26 61
N. E. Telephone & Telegraph Co., rental and service,	46 61
Paints, oils, and painting,	265 16
Pipe, fittings, etc.,	74 46
Printing and photographs,	379 52
Refreshments for committee and guests,	90 40
Refreshments for laborers,	10 20
Rent of land, Woodward street,	143 75
Rent of land for watering-trough (B. & A. R. R. Co.),	1 00
Repairs at shop,	146 19
Repair of buildings,	235 22
Repair of meters and gate-house, Leicester,	14 27
Repair of streets,	98 18
Rubber goods,	1 15
Sewer pipe, cement and sand,	92 97
Stone posts, wall stone and labor,	5 92
Taxes in Holden,	191 16
Taxes in Leicester,	491 96

Taxes in Paxton,	86 80	
Team work,	21 00	
Traveling expenses,	13 36	
Typewriting supplies,	1 00	
Watering streets,	6 36	
Ice,	65 25	
Rain and snow gauge,	10 00	
Setting up boiler,	689 57	
Cleaning reservoir, and repair of masonry and buildings,	1,879 16	
Drinking fountains,	278 50	
		$50,782 91

Revenue.

An order passed by the City Council December 21, 1900, established a uniform rate of ten cents per thousand gallons for water used exclusively for manufacturing purposes. This order took effect March 1, 1901, and, of course, made the revenue many thousand dollars less than it would have been under the former schedule. It is quite gratifying, therefore, to have the revenue nearly as large as last year, notwithstanding the reduced rates. The water bills against the School Department, amounting to $900.40, were not paid, owing to the failure of that department to provide funds for that purpose. It was also necessary to carry over a bill of $1,388.11 for water furnished a large manufacturing concern, they having a petition before the City Council for a partial abatement of the charges. These two items make the amount of uncollected bills in the hands of the treasurer somewhat larger than last year.

Canvass.

The canvass shows the total number of water takers 116,064, an increase of 2,847 over last year. Based on the comparison between our water census and the United States census of 1900, it is estimated that our present population is 121,064.

RECOMMENDED.

That the suggestions of the city engineer relating to increasing the water supply, and relieving the draft on the high service system, be adopted. It is a fact well known to everybody who is familiar with our water system that the balance of safety between the supply and demand is very slight, and with our increasing population and consequently increasing draft, we are in need of a larger supply.

Respectfully submitted,

GEORGE W. BATCHELDER,
Water Registrar.



EXCAVATION IN BED OF BROOK 73 FEET BELOW CREST OF DAM.

REPORT OF THE CITY ENGINEER.

CITY ENGINEER'S OFFICE, Dec. 9, 1901.

To the Honorable City Council of the City of Worcester.

Gentlemen: Pursuant with Section 1, Chapter 5, of the City Ordinances, I submit my report for the year ending November 30, 1901:

STREETS.

The following tables exhibit the list of streets for which surveys have been made, together with decrees for their laying out and making public preparatory to action by the City Council, and the streets upon which decrees establishing the grades thereof have been prepared:

Streets Located from December 1, 1900, to December 1, 1901.

Street.	From	To	Width, Feet.	Length, Feet.	Date of Decree.	Remarks.
Merrifield	Belmont	Elliott	50	1,186.60	Dec. 17, '00	
Lily	North Ashland	Pink		246.17	" 26, "	
Green	Bradley	South Harding		110.88	" " "	Relocated.
Norton	Lincoln	Paine	40	267.60	" " "	
Coes	Park Ave.	Mill	40	1,421.60	" 31, "	
South Harding	Endicott	Quinsigamond Avenue	40	1,778.38	Jan. 4, '01	
" "	Lafayette	Endicott	40	683.52	" " "	
Millbrook	West Boylston			1,375.44	Nov. 11, "	Relocated.
Windsor	Washington Av.	Lincoln Avenue	40	373.12	" " "	
Newport	Liberty	Edward		375.75	Oct. 14, "	
Grafton	Grafton Square	City line	50	15,335.50		Relocated. On file.
Total length				23,530.31		

Sidewalks for which Decrees have been Prepared.

Street.	From	To	Date of Decree.	Length in feet.	Side.
Orne	Lincoln	Westminster	Dec 31, 1900	313.18	North
"	"	"	" " "	313.06	South
Ashton	Sturgis	Washington Av.	June 3, 1901	610.06	East
"	"	"	" " "	610.02	West
Lily	North Ashland	Pink	" " "	245.73	North
"	" "	"	" " "	246.61	South
Norton	Burncoat	Paine	" " "	267.61	North
"	"	"	" " "	267.59	South
Wayne	Main	Baker	" " "	680.58	East
"	"	"	" " "	687.38	West
Lincoln	Belmont		" 17, "	101.20	East
Vernon	Seymour	Hillside	" " "	468.00	West
Harding	Harrison	Pond	" " "	401.00	East
Merrifield	Belmont	Elliott	" " "	1,148.64	East
"	"	"	" " "	1,144.56	West
Washington Av.	Uxbridge	Denmark	" " "	218 00	South
Whipple	Millbury	Carlstad	July 1, "	900.00	South
June	Pleasant	Chandler	" " "	3,019 00	North
Park Avenue	"	"	" " "	838.40	West
Seymour	Perry Avenue	Vernon	" " "	848.70	North
"	" "	"	" " "	857.96	South
Ward	Millbury	Wade	" " "	712.80	North
Bellevue	Chandler	Bluff	" 7, "	588.61	East
"	"	"	" " "	582.14	West
Chrome	Wall	Orient	" " "	432.03	North
"	"	"	" " "	432.01	South
Gardner	Main	Tainter	" " "	1,156.60	West
Millbury	Quinsigamond Avenue,	Ballard	" " "	3,762.00	West
Shrewsbury	Mulberry	East Worcester	" 11, "	793.00	South
Haviland	Highland	Institute Road	" " "	1,215.80	East
Barbour	Hollywood	Mason	Sept. 20, "	354.06	South
Lincoln Avenue	Brittan	Uxbridge	" " "	406.83	North
" "	"	"	" " "	411.85	South
Tainter	Hammond	Tainter Court	" " "	470.00	North
Thorne	Wall	Plantation	" " "	967.13	North
"	"	"	" " "	975.15	South



GENERAL VIEW OF FOUNDATION.

SIDEWALKS FOR WHICH DECREES HAVE BEEN PREPARED.—*Continued.*

Street.	From	To	Date of Decree.	Length in feet.	Side.
Ballard	Vernon		Oct. 19, 1901	1,550.00	South
Crompton	Brussels	Woodward	" " "	575.70	South
Chelsea	Crompton	Cambridge	Nov. 14, "	462.00	West
Downing	Woodland	Park Avenue	" " "	1,325.60	West
Batchelder	Pattison	Jefferson	" 25, "	412.35	East
"	"	"	" " "	413.35	West
North Avenue	Burncoat		On file.	422.20	South
Grand	Canterbury	Armory	"	525.00	East
Canterbury		Morse Court	"	1,890.00	South
Plympton	Whipple	Reeves	"	136.86	East
Maxwell	Henrietta	Vernon	"	427.40	North
"	"	"	"	422.40	South
Seymour	Millbury	Ward	"	411.80	South
South Harding	Endicott	Albion Avenue	"	675.00	East
" "	"	" "	"	675.00	West
" "	Green	Lafayette	"	895.80	East
" "	"	"	"	934.00	West
Ash	"	Washington	"	419.34	North
Market	Summer	Union	"	288.00	North
Hooper	Kendall		"	146.00	East
"	"		"	112.67	West
Patch	Elizabeth	Eastern Avenue	"	250.00	South
Mill	Main		"	357.00	East
"	"		"	343.50	West
Orne	Lincoln	Paine	"	268.20	North
"	"	"	"	268.90	South
Lancaster	Salisbury	Faraday	"	406.58	East
"	"	"	"	389.73	West
Dean	Highland	Institute Road	"	409.90	West
Pleasant	Park Avenue	Elm Park	"	660.00	North
Upsala	Louise	Esther	"	537.80	South
Tainter	Tainter Court	Gardner	"	909.60	North
"	Hammond	"	"	1,381.40	South
Caro	College	Boyden	"	838.90	West
Total length				47,589.27	

Surveys for the various street purposes have been made to the extent of 35.2 miles, and the records of all streets and sidewalks as decreed by the City Council have been made as heretofore.

The general street work is exhibited in the following statement:

	Number or Length in Feet.
Curb stakes set on 63 streets,	43,212
Grade for construction and macadam, 14 streets,	21,090
Cross sections for estimates, 13 streets,	20,714
Street-bounds set, new,	116
Street-bounds reset,	145
Line and grade given on applications,	234

	Number or Length in Feet.
Locations examined and approved, for electric light conduits,	33
Locations examined and approved, for gas mains,	56
Locations examined and approved, for Western Union conduits,	2
Locations examined and approved, for electric light poles,	387
Locations examined and approved, for telephone poles,	582

Decrees were prepared for the establishment of grades by the City Council on the following streets:

Street.	From	To	Length in Feet.	Remarks.
West Boylston	Barber's	Eames Road	4,600	Public
Glendale	June		2,800	Private
Forsberg	Greenwood		974	"
Total length			8,374	

The following streets were renumbered by order of the City Council, and for which plans were prepared, and notices sent in accordance therewith:

Street.	From	To	Length in Feet.
Blanche	Pattison	Jefferson	421
Cambridge	Webster Square	Millbury	8,320
Russell	Elm	Institute Road	2,600
Lincoln Avenue	Brittan	Uxbridge	400
Fremont	Cambridge	Webster	2,920
Bigelow Court Ex.	Mechanic	Foster	261
Highland	Lincoln Square	Newton Square	6,850
Total length			22,222

Seventy plans for various street purposes have been made and filed, and schedules of the amounts of paving, sidewalks, curbstone, crosswalks, and stone work laid by the Street Department have been made each month, and as exhibited in detail in the report of the commissioner.



SITE OF GATE-HOUSE.

Considerable attention was required in the reconstruction and extension of the street railway tracks in the matter of location, grade and inspection.

Plans and supervision were also furnished for the erection of bridges at Jamesville and North park.

Sewers.

The season has brought to a practical conclusion the building of the separate system of sewers, which is now in operation. A detailed statement is exhibited in the report of the superintendent.

Eight and thirty-eight hundredths miles of sewers in the aggregate have been constructed during the year, for which the plans, gradients, and other features of an engineering nature were provided. Ninety-eight plans, with the required duplicates, were made for use by the Sewer Department, together with the usual records of work constructed.

House drains have been inspected, and grades given for 551 connections, with a length of 4.58 miles.

The attention of the department has been given to the disposal of sewage at Lake View district, in accordance with the order of the City Council. Surveys and plans have been made, and further work for this purpose is now being carried on. The scope of the investigation is of such extent that some delay in the report thereon became necessary, but it is hoped that conclusions may be reached at an early date.

Water.

During the year the new dam on Tatnuck brook has been completed. The structure is located a short distance above the distributing reservoir, at a narrow part of the valley, with slopes rising rapidly from the brook upon either side. The location was formerly the site of an old mill privilege, and while possessing features not especially desirable, it was the only practicable position obtainable. The material underlying nearly the entire base of the dam was found to be a seamy

shale, which made it necessary to go to unusual depths before finding a suitable foundation. The excavations were heavy, and many difficulties were encountered in procuring a proper base from which to begin the construction. Especially across the bottom, and on the slope westerly of the brook, was the material unsound, the water from the hillside finding its way through it with ease, and in considerable quantities. The cutoffs were carried down until a firm foundation was secured, and in all blasting operations extreme care was necessary to avoid disturbing the surrounding rock. Holes of shoal depth with thirty per cent. dynamite and black powder were employed, and much excavation was made with bars and points alone. Underlying the bed of the brook boulders and clay were encountered, which finally terminated in a gorge in the rock of from 10 to 12 feet in width, with vertical walls of about six feet in height. Along the westerly side of this gorge and at its extreme bottom a large vein was uncovered, through which the water poured with considerable force. This was controlled by operating in small sections and sealing with Portland cement mortar, and small stone of cobble size. At the upper and final section of the gorge a chimney was carried up until the head of water was reached, and allowed to remain open until the beginning of this season's work, when it was filled with Portland cement grout and small stones. After the excavations under the base of the dam were carried to what was considered sufficient depth, the entire surface was sealed in various ways, as the circumstances seemed to require. The structure completed is 650 feet in length, constructed of selected earth and with a core wall of masonry. As a precaution against percolation through the seamy underlying rock, a secondary cutoff was built a short distance within the inner toe of the dam. In cross section the width on top is 24 feet, with an inner slope of $2\frac{1}{2}$ on 1, and an outer slope of 2 on 1. The height of the dam above the lowest point of excavation is 71 feet. The earthwork is composed of hardpan of excellent quality, deposited in thin layers, well compacted and protected by a heavy rip rap. The upper portions of the paving, which are liable to disarrangement by the impact of waves,



VIEW BELOW THE DAM, SHOWING GATE-HOUSES, WASTE CHANNEL, POOL AND HIGHWAY BRIDGE.

are grouted with Portland cement mortar. The cutoff walls and all other masonry within the structure are built of small hand stone laid in Portland cement mortar. The stones, which were lying in generous quantities within the basin, were hauled to the site of the dam by engine and cars and thoroughly washed before being put in place. The waste weir and channel are located at the easterly end of the dam in the natural ground, the walls being built of the firmer rock taken from the excavations. The weir is fine cut ashler, of rounded form, and with leaded joints. The floor of the waste channel is finished with granolithic, and at its terminus discharges into a basin for the purpose of diminishing the velocity. Four thirty-inch cast-iron pipes embedded in masonry were carried through the dam for supplying water to the city, and for wasting into the brook below, this provision being made in anticipation of the further needs of the city, and the introduction of the waters of Asnebumskit brook.

The valves for controlling the flow of water are placed in two gate chambers. The upper one, standing within the basin and being reached by a foot bridge from the crest of the dam, is built of ashler, and contains the valves for shutting off the water from the pipes passing through the structure, and also the ports with screens and stop planks. These valves are intended to remain open and generally unused, by reason of the depth of the wells and inconvenience of making repairs, the flow being controlled under ordinary use by the valves in the lower gate chamber, which contains a dry well of shallow depth and easily reached. The lower chamber is located near the foot of the waste channel, and, in addition to the operating valves, contains smaller ones for emptying the pipes when necessary.

The entire basin was cleaned of stumps, roots and loam with the exception of one or two very small areas which were difficult to remove. As these are to be covered by water of considerable depth they were well covered with good gravel and allowed to remain. At convenient places in the basin, loading platforms were built, to which the material was brought in carts and thence conveyed by cars below the dam. All of

the westerly portion of the basin was removed and thus deposited for the purpose of filling the unsightly gorge existing there, and as a means of providing a location for the town way which formerly crossed the valley through the basin. The road was carried over the waste channel on a two-arch stone bridge, immediately below the weir. The town way, which formerly ran along the slope of the hill and within the westerly part of the basin, was relocated and built at a higher level.

Upon the completion of the dam in the early part of September, the buildings were torn down and the tools and appliances removed to the site of the proposed dam on Kettle brook. Good progress has been made upon this structure, and it is hoped to complete the work before the close of another season.

The rainfall during the year has been above the average, and yet the condition of the reservoirs at the present time is anything but assuring. During the past four years the increased use of water for all purposes is 50 per cent. in excess of the draft for 1897, while the storage during this period has increased less than 25 per cent. As the storage prior to that time was inadequate, it is obvious that the supply is not keeping pace with the demand. A period of low rainfall would very soon create a condition of affairs not pleasant to contemplate, and I repeat my former recommendation that no delay occur in making secure a requisite storage. The work now under way upon Kettle brook, together with the repairs necessary at the Paxton reservoir, will occupy at least two seasons, and upon completion will add very little to the resources of the department in time of stress. The high-service system, particularly, requires your attention. The draft from this source is nearly 190 per cent. in excess of the demand but four years ago, and as the Kettle and Lynde brooks together furnish the entire high-service supply and are not easily reinforced from other streams, it is manifest that its use should be restricted to those portions of the city that can not be supplied through the low service. The excessive use of the high-service water for all purposes taxes this system to its



VIEW OF DAM FROM THE BASIN.

utmost, and unless rectified will surely fail to afford protection in time of drought.

I recommend that the low level portions of the South Worcester and Quinsigamond districts be supplied from the low service, through suitable mains extended to these localities. I also recommend that the use of the high-service water for elevator purposes be discontinued.

I am of the opinion that the time has arrived when the city should avail itself of the waters of Asnebumskit brook, and I further recommend that the necessary action to acquire this stream be taken at an early date.

The following table shows the monthly and annual, and the average daily and monthly consumption of water, in gallons, including waste and leakage for the year.

Months.	Consumption per Month.	Average Monthly Consumption.	Average Daily Consumption per Month.	Average Daily Consumption for the Year.
December	302,019,960		9,742,579	
January	291,959,360		9,418,044	
February	257,229,720		9,186,776	
March	262,271,240		8,460,363	
April	258,015,120		8,600,504	
May	286,611,160		9,245,521	
June	305,303,680		10,176,789	
July	320,458,160		10,337,360	
August	298,272,480		9,621,693	
September	261,126,800		8,704,227	
October	263,871,960		8,511,999	
November	251,416,260		8,380,542	
Total	3,358,555,900	279,879,658		9,201,523

The maximum consumption of water for one day amounted to 12,641,200 gallons.

Average daily gallons per capita of water users, 79.

A resurvey of the Lynde brook reservoir and adjoining land owned by the city, with suitable maps of the same, were made during the year.

The new basin at Holden has been cross-sectioned for the purpose of ascertaining its storage capacity, and the calculations are now being made. Additional purchases of land made by the city in the vicinity of this reservoir have been surveyed, and maps made for the use of the department.

Miscellaneous.

The attention of the department upon work of a general nature has been of more than the usual importance, particularly that relating to the abolition of grade crossings upon the southern railroads. Plans of all the crossings lying between the Union Station and Cambridge street were prepared with relation to this matter. The new map of the entire city has been completed for use by the various committees.

For the Public Buildings Department six buildings were laid out and other measurements made as requested, and for the Assessors Department a large tract of the Greendale district was surveyed and mapped, together with much other work for the general use of the assessors.

The usual record of the temperatures has been kept as heretofore.

It is a pleasure to also include in this report a recognition of the valuable services of my assistants.

Respectfully submitted,

FRED'K A. McCLURE,
City Engineer.

ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR, AND THE CITY ENGINEER

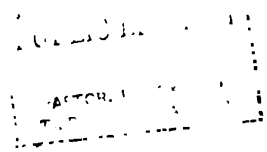
OF THE

CITY OF WORCESTER,

FOR THE

YEAR ENDING NOVEMBER 30, 1902.

WORCESTER, MASS.:
PRESS OF CHARLES HAMILTON,
311 Main Street,
1903.





RESERVOIR, No. 3. VIEW BELOW DAM SHOWING GATEHOUSE AND WASTE CHANNEL.

ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR, AND THE CITY ENGINEER

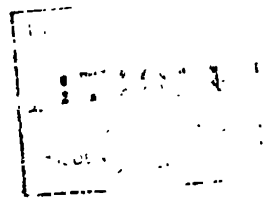
OF THE

CITY OF WORCESTER,

FOR THE

YEAR ENDING NOVEMBER 30, 1902.

WORCESTER, MASS.:
PRESS OF CHARLES HAMILTON,
311 MAIN STREET.
1903.



WATER COMMITTEE.

Alderman GEO. M. WRIGHT.
Alderman EDW. D. CUNNINGHAM,
Alderman JOHN H. MEAGHER,
Councilman DAVID A. DONLEY,
Councilman GEO. N. WHITE,
Councilman EDW. S. CLARK,
Councilman JOHN J. POWER.

WATER COMMISSIONER.

JOHN G. BRADY.

WATER REGISTRAR.

GEO. W. BATCHELDER.

ANNUAL REPORT

OF THE

WATER COMMISSIONER.

To the Honorable City Council of the City of Worcester.

Gentlemen:—In compliance with the requirements of the City Ordinances I herewith present the Annual Report of the Water Commissioner, for the year ending November 30, 1902.

In addition to the general and detailed statement of work done by the department, during the year, there is included a brief description of the water works systems of the city.

The water supply for the city, was incorporated as the Worcester Aqueduct Company, February 18, 1845, and the supply taken from Bell Pond (so-called), within the city limits.

This pond had an area of eleven acres, and a capacity of 30,000,000 gallons. Within a few years from the time this aqueduct was completed, it became apparent that a larger supply was needed, but no steps were taken towards obtaining the same until 1864, when authority was granted, by the Legislature, to take and convey into and through the city the waters of Lynde brook, in town of Leicester.

This reservoir, which was constructed in 1864–5, is located in the town of Leicester, five and five-eighths miles from City Hall, and has an area of 143 acres. Area of water shed 1,870 acres, capacity of reservoir 681,000,000 gallons. Elevation above Main street, at City Hall 340.70 feet. From this source all high service supply is taken through two lines of twenty-four inch cast iron pipe, direct to the city.

This reservoir also furnishes a portion of the low service supply, which is drawn through a line of thirty inch pipe connecting with the Parsons' distributing reservoir, which has

an elevation of 237.8 feet, and a capacity of 9,000,000 gallons.

From this distributing reservoir a portion of the city is supplied through a line of forty inch pipe. There are four reservoirs on the Kettle brook system, which have a water shed of 2.314 acres, and a total capacity of about 655,000,000 gallons. These reservoirs are connected to the Lynde brook reservoir with a thirty inch cast iron conduit.

The Tatnuck brook reservoirs are located in the town of Holden, five miles from City Hall. The first reservoir was built in 1883, and raised ten feet in 1893. Present capacity 729,000,000 gallons, having an area of 94.52 acres. Area of water shed, on this system, about 3.148 acres. An additional reservoir, with a capacity of about 450,000,000 gallons, has been constructed on this brook.

The distributing reservoir on this system is located some distance below the larger reservoirs, and contains 2,500,000 gallons; from this reservoir a thirty inch cast iron main pipe is laid to the city.

An additional line of large pipe, from this source to the city is needed, and no doubt will be constructed in the near future.

The low service supply being drawn from two sources, it was important to know what proportion was furnished from either system; and to obtain these measurements, Venturi meters were placed on all the lines of pipe entering the city, a thirty inch on the Holden supply, two twenty inch on the Lynde brook lines of high service, and a forty inch on the low service line from Parsons' distributing reservoir.

These meters afford the means to accurately measure all the water drawn from the different sources of supply, to the city.

The construction of additional storage reservoirs, on the Holden and Kettle brook systems, should have been commenced several years earlier, in order to keep pace with the rapidly increasing demands of the city, and also to provide ample protection against such droughts as frequently occur, and are liable to confront us at any time.

It must also be borne in mind that the city is growing in

all directions, which calls for many extensions to the pipe lines, as well as for an increase in the supply, which, of course, should be ample to supply all the demands upon it during the dry periods.

Additional supply and storage beyond that now under construction is imperatively needed and which will require much thought, labor and large financial backing, and at least two or three years before it could be made available; I therefore earnestly recommend that this matter receive early attention.

Summary of Statistics.

Dates of construction, 1845-1864-1883-1893-1895-1896-1900-1901-1902.

Works owned by the city.

Source of supply—impounding reservoirs in Leicester, Paxton and Holden.

Mode of supply—gravity.

Capacity of reservoirs—2,516,000,000 gallons.

Average pressure—High service 150 pounds, low service 70 pounds.

Number of miles main pipe 2″ to 40″ diameter,	180.92
Number of miles service pipe,	126.09
Number of Fire Hydrants,	1867
Number of Water Gates,	2656
Number of Water Meters,	13,076
Total cost of works to date, Dec. 1, 1902,	$3,901,117 63

Recommendations.

First. The daily consumption of water has increased far in excess of that warranted by the increase in population, and in order to regulate and account for a larger per centage of the amount delivered into the city, I would recommend that all large supplies furnished to individuals and corporations be metered.

Second.—That the low service be extended through Cambridge and Millbury streets to Quinsigamond Village, in order

to relieve the high service system, which is overtaxed and which should be reserved for that portion of the city which the low service will not reach.

Third.—That the use of high service water for elevators be discontinued after January 1, 1904.

Fourth.—That stand pipes be provided for street sprinkling darts, instead of allowing the supply to be taken from fire hydrants.

Fifth.—The necessity of larger appropriations in order to extend the water service in growing sections of the city.

Sixth.—As the present water supply and storage of the city, including the work now under construction, is inadequate for the needs of the city, through a period of low rainfall, I would recommend that this matter receive early attention.

The distribution systems have been extended in twenty streets, making a total of 3.242 miles of pipe added during the year.

Fire Hydrants.

Thirty-nine fire hydrants have been set during the year. The total number now in service for fire protection is 1867. Of this number 193 are on the premises of individuals and corporations.

Number of water cart hydrants in use,	105
Number of car sprinkling hydrants in use,	39
Number of drinking fountains in use,	9
Number of watering troughs in use,	18

Elevation of Reservoirs Above Main Street at City Hall.

KETTLE BROOK RESERVOIR, NO. 1.

Rollway, 364.36 feet.

KETTLE BROOK RESERVOIR, NO. 2.

Rollway, Not completed.

KETTLE BROOK RESERVOIR, NO. 3.

Rollway, 559.00 feet.

KETTLE BROOK RESERVOIR, NO. 4.

Rollway, 601.74 feet.

LYNDE BROOK RESERVOIR.

Rollway, 341.94 feet.

PARSONS' RESERVOIR.

Rollway, 237.80 feet.

HOLDEN STORAGE RESERVOIR, NO. 1.

Rollway, 269.88 feet.

HOLDEN RESERVOIR, NO. 2.

Rollway, 237.80 feet.

HOLDEN DISTRIBUTING RESERVOIR.

Rollway, 177.00 feet.

Elevation of Main street, at City Hall, above tide water 481 feet.

Water pressure at City Hall, low service, 70 pounds.

Water pressure at City Hall, high service, 150 pounds.

In addition to the service pipes, which are reported in tabulated form, there have been forty-six (46) service pipes changed, for which 620 feet of pipe was used in the streets, and 1,797 feet on the premises of the owners.

Three thousand, eight hundred and ninety (3,890) feet of temporary mains have been laid, the persons thus supplied paying the expense of trenching and laying, and for pipe exceeding 100 feet.

The following tables will show rainfall at the reservoirs, sizes of pipe laid, also number of gates and hydrants set during the year.

TABLE

Showing the daily height of water in HOLDEN RESERVOIR and the rainfall for the year ending November 30, 1902.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	22.10		30.72		30.16	.12	31.17	1.58	30.23		31.24	.30	31.10		28.95	.15	26.63		23.75		21.32	.43	21.78	
2	22.18		30.30		30.20	.44	30.67	.49	30.18		31.36		31.08		28.93		26.46		23.68	.02	21.25	.01	21.76	
3	22.22		30.30	.26	30.26	.07	30.63		30.16		31.37	.09	31.02		28.78	.23	26.37		23.55		21.19		21.73	
4	22.35	.51	30.29		30.23		30.34		30.12		31.43		30.98		28.73		26.33		23.43		21.14		21.73	
5	22.35	1.03	30.21		30.15	.02	30.21		30.13		31.49	.06	30.96	.13	28.73	.08	26.13		23.33	.14	21.11		21.69	
6	22.35		30.24		30.13		30.19	.65	30.26		31.53		30.94		28.68	.04	26.09	.59	23.22		21.13	.70	21.72	.15
7	22.35		30.22		30.12		30.14		30.15	.14	31.57	.07	30.68		28.56		26.06	.05	23.10	.10	21.18	1.03	21.78	
8	22.35		30.22	.10	30.11		30.05		30.22		31.61		30.63	.12	28.49	.09	25.94	.36	22.93		21.18		21.93	
9	22.35		30.20	.01			29.96	.97	30.62		31.63		30.53	.29	28.37		25.86		22.84		21.10		22.03	
10	23.40	.99	30.18	.04			30.16		30.76	2.05	31.63		30.48		28.28	.24	25.72		22.74	.87	21.03		22.08	
11	23.02		30.18				30.21		30.53	.04	31.60		30.47	.15	28.19		25.71	1.34	22.74		20.92		22.08	
12	23.18		30.22	.47			30.30	.03	30.37	.03	31.53		30.46		28.07		25.71	.46	22.63		21.21	.95	22.14	.23
13	23.30		30.18				30.52	.02	30.33	.04	31.52	.02	30.37		27.96		25.69		22.53	.34	21.12		22.05	
14	25.55	.12	30.17			.01	30.35	.18	30.33		31.52		30.26	.46	27.89		25.67		22.53	.16	21.09		22.05	.01
15	25.43	2.58	30.16				30.23		30.22		31.50		30.13	.01	27.86	.64	25.65		22.41		21.07		22.22	.01
16	27.60		30.15				30.14		30.18		31.45		30.10	.04	27.80		25.54		22.30		21.03		22.30	
17	27.77	.07	30.13				30.57	1.29	30.11		31.44		30.06	.26	27.84		25.45		22.15		20.90		22.38	
18	28.47	.02	30.12			.61	30.41		30.15		31.36		29.99		27.62		25.35		22.06	.03	20.88		22.39	
19	28.64		30.12	.05			30.27		30.27		31.34		29.89		27.38		25.18	.34	21.95	.22	20.83	.02	22.47	
20	28.85	.02	30.12				30.15	.09	30.28		31.34	.34	29.79	.11	27.36	.50	25.15		21.91	.08	20.83		22.39	
21	28.98		30.12				30.18	.14	30.38		31.34		29.69		27.40	1.01	25.02	.04	21.79	.01	20.68		22.44	
22	29.10		30.30	1.27		.80	30.18		30.38		31.33		29.63	.44	27.39	.62	24.96		21.74		20.58		22.47	
23	29.22		30.48	.05			30.17		30.42		31.31		29.59	.08	27.46	.05	24.90		21.65		20.53	.14	22.53	.05
24	29.38	.82	30.34				30.15		30.50		31.28		29.56		27.34		24.70	.17	21.68		20.43		22.59	
25	29.58	.06	30.26				30.26		30.43		31.23	.01	29.55		27.26	.01	24.63		21.43		20.38	.03	22.62	
26	29.73		30.19			.48	30.20		30.44	.59	31.16	.57	29.35		27.17		24.53		21.31	.29	20.31		22.65	.40
27	29.83	1.00	30.26	.56		.02	30.18		30.58		31.16	.38	29.31	.33	27.13	.03	24.37		21.23	.24	20.21		22.61	.08
28	29.86		30.33		30.20		30.15	.01	30.63		31.18	.06	29.18		27.08		24.24		21.14	.05	20.79	2.87	22.66	.04
29	30.09	1.60	30.24				30.22	1.08	30.61		31.19		29.09	.19	26.95		24.12		21.23	1.37	21.48		22.75	
30	31.11	1.27	30.19	.03			30.40		30.70	1.23	31.17	.04	29.09		26.91		24.06		21.21	.04	21.63		22.74	
31	30.72		30.17				30.36	.05			31.13				26.77		23.83	.30			21.73			
Totals		10.09		2.84		2.57		6.68		4.12		1.94		2.61		3.69		3.65		3.96		6.18		.97

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 30.10 feet.
Rainfall for year ending November 30, 1902, 49.30 inches.

TABLE

Showing the daily height of water in LYNDE BROOK RESERVOIR and the rainfall for the year ending November 30, 1902.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	24.05		37.15		36.50	.07	36.46	1.64	38.16		38.20	.46	36.10		36.08	.13	33.30		32.73		29.24	.19	29.12	
2	24.00		37.13		36.46	16	37.54	.51	38.07		38.28		36.08		36.04		33.16		32.62	.01	29.23	.31	29.00	
3	23.88		37.11	.11	36.51	.36	38.12		38.06		38.21	.10	36.00		36.00	.22	33.05		32.65		29.15		29.00	
4	23.94	1.58	37.07		36.40		38.15		37.98		38.18		36.00	.18	35.94		33.10		32.50	.14	29.07		28.94	
5	23.91		37.00		36.34	.01	38.10		37.93		38.11	.02	35.91		35.90	.06	32.96		32.38		28.96	.62	28.89	
6	23.83		37.00		36.20		38.15	1.41	37.90		38.00		35.81		35.90		32.80	.63	32.12		29.11	1.11	28.85	
7	23.78		36.89		36.13		38.06		37.90	.12	38.00	.07	35.62		35.74		32.89	.07	31.94	.31	29.12		28.84	.19
8	23.71		36.81	.07	36.00		38.00		37.88		38.00		35.84	.33	35.60	.02	32.95	.26	31.85		29.04		28.80	
9	23.75		36.73	.01	35.91		38.04	1.08	38.36	1.78	37.93		35.85		35.40		33.05		31.55		28.85		28.80	
10	23.93	.92	36.64	.01	35.81		38.17		38.50	.65	37.80		35 80	.13	35.30	.16	33.11		31.55	.92	28.70		28.72	
11	24.95		36.55		35.65		38.26		38.30		37.70		35.84		35.20		33.20	1.17	31.40		28.52		28.68	
12	25.27		36.40	.40	35.54		38.32	.04	38.20	.09	37.70		35.76		35.00		33.42	.41	31.25		28.55	.98	28.66	.21
13	25.47		36.40		35.45		38.44		38.14	.07	37.62	.01	35.74	.48	34.85		33.75		31.11	.32	28.75		28.62	
14	26.00	.13	36.23		35.35	.01	38.42	.14	38.04		37.55		35.82		34.65		33.76		31.00	.15	28.75		28.60	.04
15	28.25	2.32	36.18		35.20		38.21		38.00		37.40		35.84	.09	34.37	1.00	33.68		31.00		28.60		28.51	
16	30.90		36.09		35.15		38.16		38.00		37.25		35.83	.15	34.50		33.62		30.85		28.50		28.45	
17	31.37	.06	36.07		35.05	.34	38.44	1.34	37.97		37.20		35.78		34.30		33.58		30.73		28.36		28.38	
18	31.50	.04	35.95		35.05	.19	38.46		37.92		37.15		35.86		34.08		33.52		30.65		28.27	.01	28.32	
19	31.65		35.90	.03	34.93		38.27		37.90		37.03		35.86	.19	33.97	.05	33.52	.26	30.50	.25	28.12		28.19	
20	31.93	.01	35.81		34.82		38.18	.16	37.85		37.03		35.91		33.87	.45	33.52		30.34	.04	28.07		28.11	
21	32.15		35.72		34.72		38.15	.08	37.80		36.90		35.96	.46	34.00	1.26	33.48	.03	30.10		27.82		28.04	
22	32.33		35.86	1.45	34.65	.76	38.14		37.74		36.85		36.04	.07	33.98	.11	33.43		30.05		27.77		27.98	
23	32.42		36.61		34.56		38.13		37.69		36.75		36.13		33.94	.47	33.32		29.85		27.64	.11	27.88	.02
24	32.52	.82	36.68		34.50		38.09		37.53		36.66		36.17		33.85		33.17		29.65		27.48		27.77	
25	33.01		36.66		34.35		38.03		37.55		36.46		36.16		33.78	.01	33.05	.13	29.46		27.38	.02	27.68	
26	33.33	.04	36.63	.60	34.30	.58	38.00		37.63	.61	36.45	.45	36.15	.32	33.66		32.98		29.30	.15	27.23		27.50	
27	33.64	.74	36.67		34.44	.10	38.00		37.74		36.36	.16	36.16		33.46	.05	32.92		29.20	.21	27.15	.01	27.46	.51
28	33.90		36.82		34.92		37.98	.01	37.77		36.36	.23	36.14		33.42		32.86		29.07	.19	27.28	2.84	27.36	.01
29	34.18	.73	36.80	.02			38.04	1.04	37.67		36.31		36.11		33.30	2.02	32.77		29.20	1.29	28.85		27.27	
30	36.11	1.44	36.73				38.31		37.80	1.24	36.21	.03	36.08	.25	33.44		32.65	.06	29.27	.02	29.15		27.21	.01
31	37.04	.29	36.63				38.22	.01			36.17				33.40		32.65				29.15			
Totals,		9.12		2.70		2.58		7.46		4.56		1.53		2.65		6.01		3.02		4.00		6.20		.99

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway, 37.40 feet. Rainfall for the year ending November 30, 1902, 50.82 inches.

Length and Size of New Pipe Laid During the Year Ending November 30, 1902.

Street.	Location.	Pipe. Size in Inches.	Pipe. Length in Feet.	Hydrants.	Gates.	Service.
Ames,	From Vernon street, easterly,	8	634	1	1	High.
Amherst,	" end of pipe, easterly,	8	250			High.
Channing,	" end of pipe to Forbes street,	12	745		3	High.
Coes,	" Buffum street, westerly,	8	864	2	5	Low.
		10	236			
		16	93			
Derby,	" South Stowell street, southerly,	8	322	1		High.
Eaton Place,	" end of pipe, southerly,	4	68	1	1	High.
Endicott,	" Millbury street, westerly,	8	400	1	1	Low.
Greenwood avenue,	" Plantation street, easterly,	6	268	1		Low.
Hope avenue,	" Webster street, easterly,	14	438	1	1	Low.
Lincoln,	" Lincoln square to Garden street,	12	1794			
		16	160	4	4	High.
Palfrey,	" Bloomingdale to Greenwood avenue,	6	565		2	Low.
Proctor,	" Hastings avenue to Scrimgeour road,	8	898	1	1	High.
Scott,	" Lamartine to Lafayette street,	8	585	2	1	Low.
Scrimgeour road,	" end of pipe to Proctor street,	12	350	1	3	High.
Sherbrook avenue,	" end of pipe to Anna street,	6	984	2		Low.
South Harding,	" Lafayette to Larmartine street,	8	629	2	2	Low.
South Stowell,	" Granite to Derby street,	8	319	1		High.
Stafford,	" Ludlow street, westerly,	12	621	1	3	High.
Stoneland road,	" Main street, easterly,	12	404	2	4	Low.
Wilson,	" Seward street, westerly,	8	257	1	1	Low.
			11,884	25	33	

LENGTH AND SIZE OF PIPE RELAID DURING THE YEAR ENDING NOVEMBER 30, 1902.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		Size in Inches.	Length in Feet.			
Hammond,	From Southbridge street, westerly,	30	117		2	Low.
Lafayette,	" Southbridge to Quinsigamond avenue,	30	443		2	Low.
		30	2600			
		24	131	6	23	
Quinsigamond ave.	" Lafayette to Millbury street,	16	63			
		12	144			Low.
		10	100			
		8	226			
School,	" Commercial to Summer street,	16	630	2	7	Low.
Southbridge,	" Hammond to Lafayette street.	30	782	3	6	Low.
			5236	11	40	

Location, Size and Kind of Hydrants Located During the Year Ending November 30, 1902.

STREET.	LOCATION.	KIND.	Size.	Size of Connections.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Ames,	On N. W. corner Fairbanks street,	Florence,	8	8	2½	2	8	80	H.
Coes,	On S. W. corner of Coes and Buffum streets,	Chapman,	8	8	2½	2	8	55	L.
"	On dividing line of Cameron and Coes lot,	"	8	8	2½	2	8	55	L.
Derby,	On N. W. corner South Stowell and Derby streets,	Florence,	8	8	2½	2	8	70	H.
Eaton place,	At extreme S. end of place,	Chapman,	6	6	2½	2	4	130	H.
Endicott,	On N. W. cor. Endicott and South Harding streets,	Philadelphia,	6	6	2½	2	8	80	L.
Greenwood avenue,	On E. line of Waites' lot,	"	6	6	2½	2	6	40	L.
Hope avenue,	On N. side of street, 10 ft. W. of E. line of Mallett's house,	Chapman,	8	8	2½	2	14	60	L.
Lincoln,	82 ft. S. of Keefe place,	Florence,	8	8	2½	4	12	140	H.
"	9 ft. S. of Kendall street,	"	8	8	2½	4	12	145	H.
"	On N. line of Morgan's shop,	"	8	8	2½	4	12	150	H.
Lincoln square,	On N. line of lot 5, 1 ft. 6 in. E. of E. line of Lincoln street, 8 ft. 6 in. N. of N. line of lot 5,	Chapman,	8	8	2½	4	12	140	H.
Proctor,	350 ft. N. of Hastings avenue,	Florence,	8	8	2½	2	8	107	H.
Quinsigamond avenue,	On N. W. corner Quinsigamond ave. and Lafayette st.,	Chapman,	8	8	2½	4	30	85	L.
" "	Opposite Ellsworth street,	"	8	8	2½	2	30	85	L.
" "	On 12 in. connection to Worc. Gas Works, 10 ft. 8 in. W. of second driveway to same,	"	8	8	2½	2	30	85	L.
" "	On N. E. cor. Quinsigamond ave. and Endicott street,	"	8	8	2½	2	30	85	L.
" "	On N. E. cor. Quinsigamond ave. and Sigel street,	"	8	8	2½	2	30	85	L.
" "	On W. side of avenue, 184 ft. N. of Cambridge street,	"	8	8	2½	2	30	85	L.
School,	On S. W. corner Union street,	"	8	8	2½	2	16	72	L.
"	12 ft. E. of railroad,	"	8	8	2½	2	16	75	L.
Scott,	On S. W. corner Lamartine and Scott streets,	Philadelphia,	6	6	2½	2	8	82	L.
"	On S. line of school-house lot,	"	6	6	2½	2	8	82	L.
Scrimgeour road,	On S. E. corner Proctor street,	Florence,	8	8	2½	2	12	102	H.
Sherbrook avenue,	On N. line of lot 28,	Philadelphia,	6	6	2½	2	6	97	L.
" "	On N. W. corner Lake View street,	"	4	4	2½	2	6	97	L.
Southbridge,	On N. E. corner Southbridge and Lafayette streets,	Chapman,	8	8	2½	4	30	85	L.
"	56 ft. S. of R. R. bridge,	"	8	8	2½	2	30	85	L.
"	Opposite Hammond street,	"	8	8	2½	4	30	85	L.
So. Harding,	On S. W. corner Lamartine street,	Florence,	8	8	2½	2	8	85	L.
" "	On S. line of lot No. 11,	"	8	8	2½	2	8	85	L.
So. Stowell,	On N. W. corner Granite and South Stowell streets,	"	8	8	2½	2	8	70	H.

Stafford,	On S. side of street, 612 ft. W. of Ludlow street,	Chapman,	8	8	2½	2	12	110	H.
Stoneland road,	On corner of Main street and Stoneland road,	"	8	8	2½	2	12	70	L.
" "	350 ft. E. of corner of Main street and Stoneland road,	"	8	8	2½	2	12	70	"
Wilson,	On N. side of street, 6 ft. W. of E. line of house No. 2,	Florence,	8	8	2½	2	8	75	"

PRIVATE HYDRANTS.

Gates Lane,	Worc. Con. St. Ry. Co., in yard,	Chapman,	6	6	2½	2	6	70	L.
" "	Worc. Con. St. Ry. Co., in yard,	"	6	6	2½	2	6	70	L.
" "	Worc. Con. St. Ry. Co., in yard,	"	6	6	2½	2	6	70	L.

TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE IN NOVEMBER, 1902.

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1902,	10,317	98	78,146	249,152	198,715	18,228	163,210	13,656	108,409	500	29,526	27,859	21,171	6,134	15,743	178.187	1,828	2,583
Laid in 1902,			68	1,817	5,384	336	4,058	438	946			131	3,942			3.242	39	73
Total,	10,317	98	78,214	250,969	204,099	18,564	167,268	14,094	109,355	500	29,526	27,990	25,113	6,134	15,743	181.429	1,867	2,656
Pipe taken up 1902,				630	736		1,324									.509		
Total Feet,	10,317	98	78,214	250,339	203,363	18,564	165,944	14,094	109,355	500	29,526	27,990	25,113	6,134	15,743		1,867	2,656
Total Miles,	1.953	.018	14.813	47.412	38.515	3.515	31.428	2.669	20.711	.095	5.592	5.301	4.756	1.161	2.981	180.920		

SERVICE PIPES LAID TO NOVEMBER 30, 1902.

	In the Street.		Premises of Individuals.		Number
	Feet.	Miles.	Feet.	Miles.	
Prior to 1887	171,603.36	32.498	188,386.48	35.676	7,629
1887	9,674.	1.832	11,418.25	2.162	469
1888	8,814.75	1.669	13,872.	2.627	431
1889	10,021.75	1.898	11,264.5	2.133	472
1890	9,300.58	1.761	13,972.9	2.644	449
1891	9,307.5	1.762	14,276.66	2.704	483
1892	10,012.58	1.896	12,803.25	2.424	506
1893	8,616.25	1.631	11,064.	2.095	430
1894	7,218.	1.367	11,035.	2.09	366
1895	7,469.	1.414	12,407.	2.35	366
1896	7,067.83	1.34	8,796.	1.66	346
1897	8,324.11	1.576	9,805.2	1.857	383
1898	7,291.	1.38	12,878.75	2.439	342
1899	7,234.25	1.37	12,134.	2.298	336
1900	6,047.25	1.126	8,241.50	1.56	284
1901	6,506.75	1.232	7,291.25	1.38	315
1902	4,604.	.872	7,255.	1.374	225
	299,112.96	56.624	366,901.74	69.473	13,832

WATER CART HYDRANTS.

Aetna,	Near Coral St. 10′ 6″ out from stand pipe.
Benefit,	59′ 7″ E. of E. line of Beacon St., 15′ 10″ S. of N. line of street, 26′ 6″ out from stand pipe.
Bloomingdale,	104′ E. of E. line of Grafton St. (S.), 15′ 9″ N. of S. line of street, 22′ out from stand pipe.
"	7′ 8″ out from stand pipe.
Bowdoin,	13′ E. of E. line of Chestnut St., 5′ N. of stand pipe.
Bridge,	36′ 6″ W. of W. line of Viaduct Wall (S.), 20′ 4″ out from stand pipe.
Burncoat,	21′ E. of W. line of street, 18′ 9″ N. of N. line of Melville St.
Cambridge,	12′ 6″ S. of N. line of street, 3′ 6″ E. of W. line of Southbridge St.
"	11′ 6″ out from stand pipe.
"	16′ 9″ S. of N. line of street, 25′ E. of E. line of Douglas St.
" cor. Douglas,	15′ S. of N. line of street, 25′ E. of E. line of Douglas St.
Carroll,	7′ out from stand pipe.
Chandler,	43′ 6″ W. of W. line of Newbury St., 20′ 9″ out from stand pipe.
" near Park Ave.,	30′ W. of W. line of Park Ave., 7′ 3″ out from stand pipe.
" " Bellevue,	16′ E. of W. line of Wright's new machine shop, 24′ 8″ N. of stand pipe.
Chatham,	75′ 6″ E. of E. line of Houchin Ave., 12′ out from stand pipe.
Crescent,	23′ 8″ out from stand pipe.
Crown,	4′ 4″ out from stand pipe.
Eastern Ave.,	Near Belmont St., 19′ 10″ out from stand pipe.
E. Central near Ford,	26′ 2″ out from stand pipe.
Florence,	8′ 7″ out from stand pipe.
"	25′ N. of N. line of Charlotte St., 16′ E. of W. line of Florence St.
Foster,	12′ 8″ out from stand pipe.
Front,	63′ 7″ W. of W. line of Church St., 64′ N. of stand pipe.
Fruit near Dayton,	7′ out from stand pipe.
Garden,	54′ 3″ W. of W. line of Lincoln St., 19′ 6″ N. of S. line of Garden St., 23′ 9″ out from stand pipe.
Grand,	16′ 6″ E. of E. line of Illinois St., 26′ 6″ out from stand pipe, 5′ 9″ out from stand pipe.
" near Douglas,	8′ 10″ out from stand pipe.
Green,	27′ 8″ N. of S. line of Crompton's shop, 14′ 4″ out from stand pipe.
Grove,	49′ S. of S. line of Lexington St., 34′ 3″ out from stand pipe.
"	End of wire mill, 7′ 9″ out from stand pipe.
"	Near North St., 8′ 6″ out from stand pipe.
Hermon,	14′ 4″ from S. line of barn wall on N. W. cor. Southbridge and Hermon Sts., 30′ 2″ W. of E. line of barn, 8′ 10″ S. of stand pipe.
"	9′ 6″ S. of N. line of Hermon St., 27′ E. of E. line of Main St.
Highland,	7′ 9″ out from stand pipe.
"	14′ W. of W. line of Boynton St., 10′ 3″ S. of stand pipe.
"	43′ E. of E. line of Westland St., 22′ 9″ out from stand pipe.
"	31′ 6″ out from stand pipe.
"	Near Newton Sq., 32′ 6″ out from stand pipe, 1′ 6″ E. of center of stand pipe.
	2″ drip valve to above stand pipe, 7′ out from stand pipe.
Hollywood,	S. of May St., 6′ 10″ out from stand pipe.
Institute Road,	Near Beechmont St., 3′ 4″ out from stand pipe.
" "	Near West St., 2′ 6″ out from stand pipe.
King,	17′ W. of W. line of Queen St., 24′ out from stand pipe.
	¾″ stop, 17′ 9″ W. of W. line of Queen St., 22′ 3″ out from stand pipe.
"	7′ 10″ out from stand pipe.
Lafayette,	13′ S. of N. line of street, 31′ W. of W. line of Quinsigamond Ave.,
	¾″ stop, 11′ 2″ S. of N. line of street, 32′ W. of W. line of Quinsigamond Ave.
Lagrange,	50′ S. of S. line of Beacon St., 20′ out from stand pipe.
Lake,	19′ 9″ out from stand pipe.
Lancaster,	14′ S. of S. line of Institute Rd., 27′ out from stand pipe.
Lincoln,	10′ 9″ N. of N. line of Perkins St., W. of Lincoln St., 14′ out from stand pipe.
Lodi,	4′ 3″ out from stand pipe.

WATER CART HYDRANTS (*continued*).

Madison,	7′ 2″ W. of W. line of Southbridge St., 22′ 8″ out from stand pipe.
Main,	At Hammond St., 7′ W. of stand pipe.
"	22′ 9″ W. of E. line of Main St., 35′ N. of N. line of Gertrude Ave.
"	Near Grand St., 34′ N. of N. line of Downing St., 53′ E. of W. line of Main St., 3′ 6″ W. of stand pipe.
"	Opp. Marble St., 9′ 3″ out from stand pipe.
"	Near Park St., 25′ S. of stand pipe on branch of two-way hydrant, 1′ 8″ W. of E. line of curb stone, 11′ 7″ N. of N. line of Park St.
"	Near University Park, 9′ N. of stand pipe, 2′ 10″ out from stand pipe.
Mill,	13′ 6″ N. of N. line of Quinn's block, 27′ out from stand pipe.
Millbury,	Near the mill, 1′ 9″ W. of stand pipe, 2′ out from stand pipe.
"	Near Seymour St., 10′ W. of E. line of street, 13′ 9″ S. of N. line of Seymour St.,
"	Near Greenwood St., 6′ N. of stand pipe.
"	Below the ledge, 2′ 6″ N. of stand pipe.
"	S. of Cambridge St., 13′ 3″ W. of E. line of street, 62′ 9″ N. of N. line of Whitney St.
Merrick,	107′ S. of S. line of Davis Ct., 7′ out from stand pipe.
Mulberry,	15′ E. of W. line of street, 27′ 3″ N. of N. line of Asylum St., 22′ 6″ out from stand pipe.
Oak Avenue,	18′ 9″ E. of W. line of avenue, 26′ N. of N. line of Belmont St., (W.)
Orient,	3″ valve, 21′ N. of N. line of Hamilton St., 18′ 8″ E. of W. line of Orient St.
	¾″ stop, 17′ 6″ E. of W. line of street, 22′ 3″ N. of N. line of Hamilton St.
Oxford,	15′ S. of S. line of Pleasant St., 8′ out from stand pipe.
Paine,	Near Perkins ,8′ out from stand pipe.
"	Near Vinton St., 9′ 6″ out from stand pipe.
Park Avenue,	Box on Lovell St., 28′ 3″ S. of stand pipe, 12′ E. of W. line of Park Ave.
" "	7′ out from stand pipe.
Penn "	15′ 9″ E. of W. line of avenue, 20′ 4″ S. of S. line of avenue.
Piedmont,	33′ 6″ N. of N. line of Brigham St., 22′ out from stand pipe.
Plantation,	13′ 8″ N. of N. line of Shrewsbury St., 9′ 8″ W. of E. stone wall cor. Shrewsbury and Plantation Sts., 26′ 4″ N. W. from stand pipe.
Pond,	Cor. Harding St., 7′ 9″ out from stand pipe.
Prescott,	2′ 6″ out from stand pipe.
"	Above wire mill, 9′ 10″ out from stand pipe.
"	Near North St., 21′ out from stand pipe.
Richards,	8′ out from stand pipe.
Salisbury,	18′ 6″ W. of W. line of Dean St., 7′ out from stand pipe.
"	Cor. Park Ave., 8′ 10″ out from stand pipe.
Sheridan,	Box on Shrewsbury St., 27′ N. of S. line of street, 12′ E. of W. line of Sheridan St.
Shrewsbury,	12′ 3″ N. of S. line of Shrewsbury St., 18′ W. of W. line of school-house fence.
Sigel,	66′ 6″ W. of W. line of Harding St.
Southbridge,	Near Prov. and W. R. R., 9′ 3″ out from stand pipe.
Southgate,	26′ 9″ W. of W. line of Southbridge St., 24′ 6″ out from stand pipe.
Summer,	17′ 3″ E. of W. line of street, 66′ 6″ S. of S. line of Central St.
Tainter,	Near Kilby St., 23′ 6″ W. of W. line of Tainter St., 21′ 6″ out from stand pipe.
Temple,	29′ 8″ S. of N. line of street, 22′ 10″ E. of W. line of Jourdan's barn.
Vernon,	21′ 9″ E. of E. line of Richland St., 10′ 6″ out from stand pipe.
Wall,	Near Norfolk St., 26′ out from stand pipe.
Ward,	3′ 6″ out from stand pipe.
"	19′ 6″ W. of W. line of Wade St., 17′ 6″ out from stand pipe.
Washington,	21′ 6″ N. of N. line of Plymouth St., 15′ 10″ W. of E. line of Washington St., ¾″ stop, 21′ 6″ N. of N. line of Plymouth St., 17′ 6″ W. of E. line of Plymouth St.
Washington,	19′ 3″ out from stand pipe.
Water,	8′ 9″ out from stand pipe.
Westminster,	7′ 6″ out from stand pipe.

WATER CART HYDRANTS (*continued*).

William,	7′ out from stand pipe.
"	7′ 3″ out from stand pipe.
Windsor,	N. of Harrington Ave., 19′ out from stand pipe.
Winslow,	15′ 9″ S. of S. line of Pleasant St., E. of Winslow St., 22′ out from stand pipe.
Winthrop,	Near Providence St., 6′ 3″ N. of stand pipe.
Woodland,	12′ 10″ N. of S. line of school-house lot, 6′ 10″ out from stand pipe.
"	Near Downing St., 2′ 8″ out from stand pipe.

CAR SPRINKLING HYDRANTS.

Belmont,	22′ 6″ S. of N. line of street, 36′ W. of W. line of Oak Ave.
Boynton,	17′ 4″ E. of W. line of street, 39′ N. of N. line of Highland St.
Burncoat,	14′ 6″ E. of W. line of street, 94′ S. of S. line of engine house.
E. Worcester,	At Shrewsbury St., 3′ 3″ S. of S. line of Shrewsbury St., 14′ 4″ E. of W. line of Norcross Bros.' office.
Franklin Sq.,	35′ W. of E. line of Main St., 14′ N. of S. line of Allen Ct.
Fremont,	21′ 6″ S. of N. line of street, 74′ F. of E. line of house No. 22.
Grafton,	22′ N. of S. line of street, 1′ E. of E. line of Houghton St.
"	51′ 4″ W. of E. line of Grafton St., 14′ S. of N. line of Keese St.
Grove,	Near North St., 29′ S. of S. line of North St., 17′ 6″ W. of E. line of Grove St.
Highland,	12′ 4″ S. of N. line of street, 14′ W. of W. line of 162 Highland St.
June,	17′ W. of E. line of June St., 56′ N. of N. line of Chandler St., looking west.
Lincoln,	24′ W. of E. line of street, 14′ 2″ S. of N. line of Perkins St.
Main,	16′ 7″ W. of E. line of street, 11′ 3″ N. of N. line of Beaver St.
"	39′ 4″ N. of S. line of street, 88′ W. of W. line of McMullen lot 14.
"	20′ S. of N. line of Main St., 86′ 6″ E. of E. line of Lake St.
"	31′ N. of S. line of street, 51′ 6″ W. of W. line of L part of house 1482 Main St.
"	19′ W. of E. line of street, 23′ S. of S. line of Hammond St.
Mill,	18′ W. of E. line of street, 31′ N. of N. line of Main St.
Millbury,	N. of Sigel St., 6″ gate on hydrant will shut this off.
"	26′ W. of E. line of street, 10′ N. of S. line of Maxwell St.
"	11′ 6″ W. of W. line of street, 15′ S. of N. line of Perry St.
Park Avenue,	21′ W. of E. line of Park Ave., 76′ S. of S. line of Fern St.
" "	23′ 8″ W. of E. line of Park Ave., 39′ N. of S. line of Harrington and Richardson shop.
Pleasant,	15′ S. of N. line of street, 9′ 6″ E. of W. line of 137 Pleasant St.
"	19′ 6″ S. of N. line of street, 32′ 9″ W. of W. line of Park Ave.
"	20′ S. of N. line of street, 151′ W. of W. line of 414 Pleasant St.
"	3″ valve, 18′ W. of E. line of Pleasant St., 3′ 6″ S. of N. line of Wetherell's farm house.
Providence,	107′ S. of N. line of S. pier to Crompton's driveway, 20′ 3″ E. of W. line of Providence St.
Salem,	34′ 6″ S. of S. line of Front St., 26′ 6″ W. of E. line of Salem Sq.
Salisbury,	19′ W. of E. line of street, 23′ 8″ N. of N. line of Lincoln Sq. This gate shut to the right.
"	3″ valve, 36′ 6″ E. of E. line of Park Ave., 19′ S. of N. line of Salisbury St.
Shrewsbury,	115′ S. of N. line of Hunt St., 20′ W. of E. line of Shrewsbury St.
Southbridge,	426′ 6″ S. of N. line of Lafayette St., 17′ 6″ W. of E. line of Southbridge St.
Summer,	17′ E. of W. line of street, 29′ S. of S. line of Prospect St.
Vernon,	18′ 8″ W. of E. line of street, 24′ S. of S. line of Union Ave., looking west.
Washington Sq.,	43′ 6″ W. of W. line of Summer St., 40′ 8″ N. of S. line of Front St.
Webster,	3′ 8″ E. of E. line of street, 9′ 2″ N. of S. line of Jacques St.
West Boylston,	Near Fair Grounds, 1′ S. of S. rail in center of turn-out near Fair Grounds.
" "	Near Huntington Ave., 16′ W. of E. line of W. Boylston St., 52′ S. of S. line of Huntington Ave.

DRINKING FOUNTAINS.

Belmont,	Cor. Plantation St., 24′ E. of W. line of Plantation St., 3′ 4″ N. of S. line of Belmont St.
Cambridge Sq.,	On Millbury St., 30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
Franklin Sq.,	14′ 3″ E. of E. line of Scott's block, 20′ 3″ N. of N. line of same.
Front,	Cor. Salem Sq, 65′ 6″ from base of fountain, 42′ 9″ W. of W. line of Church St.
"	Cor. Summer St., on Summer St., 26′ E. of W. line of street, 8′ 8″ N. of N. line of Front St.
Lincoln Sq.,	Cor. Main St., shut off in sidewalk.
Millbury,	Cor. Reeves St., 1′ 6″ W. of W. line of Millbury St., 27′ 9″ S. of N. line of Reeves St.
Vernon Sq.,	22′ 4″ S. of N. line of Vernon St., 8′ S. of N. line of house 108 Water St., 8′ E. of W. line of Water St.
Webster Sq.,	30′ 9″ N. of S. line of Cambridge St., 25′ 6″ W. of W. line of Webster St.

WATERING TROUGHS.

Adams Sq.,	20′ W. of E. line of Lincoln St., on S. line of Shattuck St.
Belmont,	At Lake, 11′ 6″ S. of S. line of Belmont St., 34′ 7″ E. of W. line of Lake Ave.
Chadwick Sq.,	29′ S. of hydrant, 35′ 6″ E. from watering trough.
Chandler,	10′ 2″ E. of W. line of Bellevue St., 16′ 8″ S. of N. line of Chandler St., W.
"	31′ 6″ N. of S. line of Chandler St., 6′ 9″ E. of W. line of Mill St.
Coes Sq.,	11′ 4″ W. of E. line of street, 19′ N. of N. end of parapet wall, 42′ 10″ S. of S. line of Coes shop, 56′ 8″ S. of S. line of Beaver St.
Grafton,	Cor. Hamilton St., 16′ 5″ S. of N. line of street, 32′ 6″ N. of trough, 100′ 6″ W. of W. line of Orient St.
James,	14′ out from center of trough, ½ rod stop, 11′ 9″ out from center of trough.
Lincoln Sq.,	43′ 8″ S. of N. line of Lincoln Sq., 10′ 3″ W. of W. line of Prescott St.
Millbury,	30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
"	At Greenwood St., 26′ 4″ directly E. from trough.
Pleasant,	7′ 3″ out from X on trough near the ground.
Southbridge,	33′ 2″ from W. line of Southbridge St., 28′ S. of S. line of Southgate St.
"	At Madison St., 32′ 9″ out from trough at Madison Sq., 32′ 6″ S. of S. line of 114.
"	At Stearns Sq., 6′ 3″ out from trough, 1′ 8″ S. of trough. Drip:—4′ S. of trough, 2′ 6″ W. of E. end of trough.
Vernon Sq.,	On Vernon St., 5′ 6″ above gate-box, 6′ 9″ out in direct line from where it enters the trough.
Washington Sq.,	On Shrewsbury St., 36′ 6″ S. of N. line of street, 60′ E. of E. line of Summer St.
Webster Sq.,	15′ 9″ W. of W. line of Webster St., 30′ 10″ N. of S. line of Cambridge St.

EXPENDED 1902.

WATER WORKS CONSTRUCTION.

Salary of Commissioner and clerical service,	$3,094 74
Pay-rolls, laborers,	11,966 07
Carpentering and lumber,	8 28
Car tickets and transportation of laborers,	15 00

Castings, patterns and fire-clay,	697	38
Cordage, waste and packing,	19	21
Engineers' services and material,	39	66
Express, freight and trucking,	409	07
Fuel,	27	86
Grading and paving,	2	00
Hack and horse hire,	59	50
Hardware, tools and repairs,	92	77
Hydrants, water gates, valves and repairs,	2,639	99
Inspection of pipe,	5	04
Iron and steel,	23	45
Iron pipe and freight on same,	6,880	22
Lead pipe and lead,	644	04
Meters and repairs,	2,747	60
Meters and repairs, Union Water Meter Co.,	2,048	00
Meters taken out,	29	00
Miscellaneous supplies,	2	77
New England Telephone & Telegraph Co., rental and service,	2	50
Paints, oils and painting,	6	38
Pipe, fitting, etc.,	4,423	13
Powder and fuse,		75
Refreshments for committee and guests,	9	00
Repairs, meter house,	9	75
Repairs, sewers,	77	76
Repairs, streets,	506	26
Rubber goods,		90
Sewer pipe, cement and sand,	44	20
Stone for blocking,	16	64
Stone posts, wall stone and labor,	1	95
Telegrams and telephone tolls,	1	45
August Bjorklund, abatement,	8	05
Amount refunded J. J. Sawin heirs,	9	30
		$36,569 67

PIPE EXTENSION AND IMPROVEMENT ACCOUNT.

Pay-rolls, laborers,	$5,693 68	
Carpentering and lumber,	239 89	
Castings, patterns and fire-clay,	1,049 86	
Cordage, waste and packing,	110 57	
Engineers' services and material,	13 74	
Express, freight and trucking,	766 60	
Fuel,	91 87	
Hardware, tools and repairs,	4 08	
Hydrants, water gates, valves and repairs,	4,472 70	
Iron pipe and freight on same,	42,934 20	
Lead pipe and lead,	2,858 04	
Pipe, fittings, etc.,	7 10	
Repairs, sewers,	76 18	
Repairs, streets,	219 36	
Sewer pipe, cement and sand,	48 69	
Stone for blocking,	12 79	
Stone posts, wall stone and labor,	7 00	
Testing pipe,	339 21	
Telegrams and telephone tolls,	1 00	
		$58,946 56

HOLDEN SUPPLY.

Pay-rolls, laborers,	$840 06
Carpentering and lumber,	419 02
Castings, patterns and fire-clay,	147 86
Engineers' services and material,	837 86
Express, freight and trucking,	92 46
Extra labor, sundry persons,	3 00
Grass seed,	9 87
Hack and horse hire,	95 61
Hardware, tools and repairs,	91 12
Legal expenses,	85
Miscellaneous supplies,	85
Paints, oils and painting,	16 13
Photographic supplies,	5 07

Pipe, fittings, etc.,	75	
Powder and fuse,	2 19	
Refreshments for committee and guests,	10 00	
Sewer pipe, cement and sand,	571 14	
Stone posts, wall stone and labor,	310 00	
Team work,	128 66	
Geo. W. Ryan, injury to person,	75 00	
Interior finish for gate house,	101 55	
		$3,759 05

KETTLE BROOK SUPPLY.

Pay-rolls, laborers,	$51,054 50	
Blank books, stationery and stamps,	10 04	
Boilers, engines and repairs,	19 10	
Brick and freight on same,	160 45	
Building telephone line,	54 23	
Car tickets and transportation of laborers,	7 50	
Carpentering and lumber,	194 74	
Castings, patterns and fire-clay,	115 69	
Cordage, waste and packing,	18 94	
Engineers' services and material,	2,879 15	
Express, freight and trucking,	983 06	
Extra labor, sundry persons,	5 55	
Extra service, expert engineers,	1,536 70	
Fuel,	37 26	
Furniture and fixtures,	21 95	
Hack and hores hire,	178 73	
Hardware, tools and repairs,	544 74	
Hose and couplings,	4 04	
Hydrants, water gates, valves and repairs,	179 14	
Iron and steel,	133 31	
Iron pipe and freight on same,	985 99	
Land purchased per order C. C., Dec. 27, 1898,	1,154 30	
Lead,	36 32	
Machinery, belting and repairs,	76 06	

Miscellaneous supplies,	24 09
Paints, oils and painting,	122 95
Pipe, fittings, etc.,	60 05
Powder and fuse,	1,004 51
Printing and photographing,	13 81
Recording deeds,	11 40
Rubber goods,	345 83
Seeds, plants, trees, etc.,	17 55
Sewer pipe, cement and sand,	6,052 13
Stone posts, wall stone and labor,	47 50
Team work,	17,774 43
Telegrams and telephone tolls,	1 95
Robert C. Cooper, estate, land,	5,500 00
Testing cement,	30 00
Concrete mixer,	231 17
Stone for gate house,	354 25
Roof for gate house,	242 00
Floor for gate house,	44 30
Blacksmithing,	6 53
Weir stone,	304 00
Board of teams,	61 16
Iron bridge,	228 45
William T. Forbes, land,	190 00
H. B. Watts, rent of land,	200 00
Rent of barn,	22 00
Carpentering and lumber for gate house,	336 92
Jamesville Manfg. Co., damages caused by the taking of Kettle brook,	21,900 00
Legal expenses,	5 60
Lime,	1 25
	$115,525 42

Value of stock and tools on hand November 30, 1902, $135,-170.37. Bills have been rendered to the city treasurer to the number of 1,309, amounting to $23,491.27.

Number of abatements, twenty-eight, amounting to $324,36.

Amount of bills in hands of treasurer, November 30, 1902, $2,997.44.

Amount collected during the year $23,003.56.

Respectfully submitted,

JOHN G. BRADY,

Water Commissioner.

December 15th, 1902.

REPORT OF THE WATER REGISTRAR.

To the Honorable City Council of the City of Worcester.

Gentlemen: In compliance with Section 7, Chapter 48 of the City Ordinances, the report of the income division of the Water Department for the year ending November 30, 1902, is presented.

Two hundred and thirty-two (232) applications for water were received during the year and placed in the hands of the water commissioner.

The following bills were given the treasurer for collection:

For metered water,	25,306 bills,	amounting to	$262,500 87
For annual rates,	642 bills,	amounting to	7,587 94
Total bills,	25,948	Total amount,	$270,088 81

Total amount of revenue received during the year ending November 30, 1902, $269,428.64. Of this amount $5,462.59 was from uncollected bills in the hands of the treasurer November 30, 1901.

The amount of uncollected bills in the hands of the treasurer November 30, 1902, was $3,822.64.

During the year the sum of $2,097.95 has been abated owing to changes from annual rates to metered rates, vacant tenements, and adjustment of bills of water takers. $1,308.90 was transferred.

Sixty-one services were shut off for non-payment of bills, and, with three exceptions, were immediately turned on upon payment of bills.

The quantity of metered water furnished during the year ending November 30, 1902, was as follows:

Domestic purposes,	620,608,858 gallons.
Manufacturing purposes,	354,205,904 gallons.
Steam and electric railways,	164,086,181 gallons.
Elevators,	200,844,340 gallons.
Motors,	5,900,190 gallons.
Schools,	27,184,128 gallons.
Churches,	2,810,852 gallons.
Hotels,	14,000,239 gallons.
Hospitals,	66,054,168 gallons.
Stables,	7,859,407 gallons.
Laundries,	16,678,261 gallons.
Fire department houses,	3,710,929 gallons.
Sewage purification works,	2,837,700 gallons.
Stores, offices, saloons, shops, etc.,	94,043,756 gallons.
Total metered water,	1,580,824,913 gallons.
Unmetered water (estimated),	27,000,000 gallons.
Street sprinkling,	88,592,500 gallons.
Merrifield estate,	4,505,000 gallons.
Total,	1,700,922,413 gallons.

From the two latter amounts, street sprinkling and Merrifield estate, no revenue is received.

The number of new meters set during the year was 279, making the total number now in use 13,076.

Kinds.	Sizes.										
	⅝″	¾″	1″	1½″	2″	3″	4″	6″	8″	10″	Total.
B. and F. Piston	671	57			5						736
Columbia	1	..									1
Crown	13	2									15
Desper	373	11									384
Duplex.....	1										1
Empire	1										1
Gem	1		1		1	4	7	2		2	18
Hersey	736	43	2	1	2		1				785
Hersey disc ...	522										522
Lambert	12		..								12
Nash	85										85
Shedd.....	2										2
Torrent			1			1	1	1			4
Trident	168	1									169
Union Rotary .	9,220	424	205	169	198	95	24	5	.. 1		10,341
Total ...	11,809	538	209	170	206	100	33	8	1	2	13,076

During the year, 3 Crown, 57 Desper, 2 Gem, 111 Hersey, 55 Hersey disc, 1 Lambert, 7 Nash, 76 Piston, 1407 Rotary, and 31 Trident meters have been taken off for repairs. Most of them have been repaired at the department shop and without cost to the owner. Total cost of repairs, $3,773.14.

Eleven new elevators have been put in during the past year, making the total 374.

Dwellings, Persons, Fixtures, etc., Assessed for Water in the City of Worcester.

Dwellings,	11,976	Baths,	17,230
Families,	25,670	Water-closets,	32,546
Stores,	1,239	Hose,	6,912
Offices,	1,080	Boilers,	2,851
Saloons,	118	Horses,	5,312
Markets,	79	Cows or oxen,	571
Shops,	489	Elevators,	374
Stables,	1,973	Barber shops,	113
Persons using,	119,331	Hotels,	31
Sinks,	31,789	Schools,	73
Basins,	18,805	Motors,	45

RECEIVED.

For assessments for water, 1901,	$5,462 59	
For assessments for water, 1902,	263,966 05	
Accrued interest,	678 13	
Hay and grass,	125 50	
Wood,	23 00	
		$270,255 27

EXPENDED.

Amount transferred to interest on water loan,	$141,362 50	
Amount transferred to sinking fund, per order City Council,	4,800 00	
Running expenses,	61,711 80	
		207,874 30
Balance transferred to sinking fund (water bonds),		$62,380 97

DETAILED ACCOUNT OF EXPENDITURES.

George W. Batchelder, salary,	$1,600 00
Clerical service,	1,583 81
Service of canvassers,	447 37
Service of meter readers,	4,527 97
Care of reservoirs,	2,125 50
Pay-rolls, laborers,	30,344 11
Abatement of water rates,	281 42
Blacksmithing and blacksmiths' supplies,	352 03
Blank books, stationery and stamps,	390 34
Blankets, harness and repairs,	239 20
Books and subscriptions,	28 00
Car tickets and transportation of laborers,	367 50
Carpentering and lumber,	327 16
Carts, wagons and repairs,	591 08
Castings, patterns and fire clay,	1,706 15

Chemical analyses (water samples),	144 00
Cordage, waste and packing,	84 88
Drinking fountains,	51 00
Engineers' services and materials,	417 59
Express, freight and trucking,	171 29
Extra labor (sundry persons),	127 40
Fuel,	332 22
Furniture, fixtures and repairs,	72 50
Gas,	219 80
Hack and horse hire,	205 35
Hardware, tools and repairs,	1,140 60
Hay, grain and straw,	1,718 37
Horses,	425 00
Hose and couplings,	72 18
Hydrants, water gates, valves and repairs,	512 01
Insurance,	29 15
Iron pipe and freight on same,	73 43
Iron and steel,	209 44
Lead pipe and lead,	112 06
Medical attendance on horses,	90 25
Meters and repairs,	2,060 97
Meters and repairs (Union Water Meter Co.),	1,070 38
Miscellaneous supplies,	56 85
N. E. Telephone & Telegraph Co., rental and service,	61 35
Paints, oils and painting,	256 87
Pipe, fittings, etc.,	50 79
Printing and photographs,	287 43
Putting up meter cards,	126 25
Refreshments for committee and guests,	100 00
Refreshments for laborers,	12 50
Rent of land for watering trough (B. & A. R. R. Co.),	1 00
Rent of land, Woodward St.,	825 00
Repair of buildings,	55 64
Repair of sewers,	40 46

Repairs at shop,	111 05
Repair of streets,	97 46
Rubber goods,	61 77
Sewer pipe, cement and sand,	150 55
Stone posts, wall stone and labor,	15 70
Taxes in Holden,	188 63
Taxes in Leicester,	299 90
Taxes in Paxton,	160 59
Team work,	194 59
Travelling expenses,	11 44
Watering streets,	6 36
Architects' services,	45 00
Chas. L. Peters on contract (house at Holden),	3,798 90
Chas. L. Peters, extras (house at Holden),	28 50
Cement for house at Holden reservoir,	43 89
Lumber for house at Holden reservoir,	13 05
Installing telephone wire (Kettle brook),	38 50
Powder and fuse,	34 46
American Bell Telephone Co., rent of telephones,	2 98
Repair of boiler and engines,	12 00
House drain at Holden reservoir,	46 20
Papering house at Holden reservoir,	40 00
Telephone line at Lynde brook,	28 85
Dry goods and bedding,	24 92
Tablet boards,	52 40
Services expert engineer,	75 00
Repair of fountains,	3 46
	$61,711 80

Revenue.

The total amount of collection for water rates during the present fiscal year is $269,428.64, the largest in the history of the department. The next largest revenue was $262,175.74,

which was collected during the year ending November 30, 1900, at a time when the water rates were higher than at present.

By order of the City Council, a special rate for water used exclusively for manufacturing purposes was established, to take effect March 1, 1901. I respectfully suggest to the City Council an amendment to this order which will so broaden it as to extend the so called manufacturer's rate of ten cents per thousand gallons to all industries using steam for power and employing labor. In explanation of this suggestion, I wish to state that in my opinion the city should not discriminate between the consumer who makes a finished product and the one whose labor simply advances the article one step toward completion, or who operates machinery and employs labor in his business. Under the present schedule, the special ten cent rate cannot be granted unless the consumer is a manufacturer in the legal sense of the word, and, while the broadening of the order will somewhat reduce the revenue, it seems unfair in my judgment to limit the special rate to the few who may legally be called manufacturers.

CANVASS.

The canvass of water takers shows the number of consumers to be 119,331 and the estimated population 124,331.

Respectfully submitted,

GEORGE W. BATCHELDER,

Water Registrar.

REPORT OF THE CITY ENGINEER.

CITY ENGINEER'S OFFICE, Dec. 3, 1902.

To the Honorable City Council of the City of Worcester.

Gentlemen: I have the honor to submit the following report for the Engineering Department for the year ending November 30, 1902, as follows:

STREETS.

Preparatory to action by the City Council, decrees have been prepared for the laying out and making public of 39 streets, with a total length of 6.42 miles, and also decrees for the establishment of sidewalks on 28 streets, with a total length of 6.06 miles, a list of which is exhibited in the tables following:

STREETS LOCATED FROM DECEMBER 1, 1901, TO DECEMBER 1, 1902.

Street.	From	To	Width, Feet.	Length, Feet.	Date of Decree.	Remarks.
Albert	Grand		31	276.92	Dec. 30, '01	
Ball	Mill	Baker	50	1,232.15	" " "	
Birch	Maywood	Beaver	45	1,248.56	Nov. 10, '02	Relocated.
Bloomingdale Road	Putnam Lane	Plantation	50	1,497.86	July 14, '02	Relocated.
Bradley	Washington	Gold	40	909.97	Oct. 13, '02	
Channing	Hermitage Lane	Green Lane	40	1,079.94	On file.	
Coes	Park Avenue	Mill	40	1,399.36	Oct. 13, '02	Relocated.
Dartmouth	Plantation	Columbus Ave	50	959.95	" " "	
Duncan Ave.	Cambridge		40	541.55	Nov. 24, '02	
Dupont	Hamilton	Chrome	40	376.17	Oct. 13, '02	
Englewood Av.	Lovell	Circuit Ave.	45	1,550.00	Dec. 30, '01	
Esther	Vernon	Upsala	40	1,365.94	On file.	
Everard	Belmont	Vinson	40	1,021.80	Oct. 13, '02	
Forbes	Lincoln	Westminster	40	324.36	" " "	
Hackfeld Rd.	Highland	Institute Rd.	50	898.06	July 21, '02	
Heardsleigh	Summer	Fountain	40	407.57	Dec. 30, '01	
Isabella	Englewood Av.	Circuit Ave.	40	588.90	" " "	
Kingsbury	Hollywood	Page	40	291.53	" " "	
Litchfield	Crystal	Hacker	40	940.22	Nov. 24, '02	
Louise	Vernon	Upsala	40	901.45	On file.	
Lyon	Shrewsbury	E. Worcester	40	716.57	Oct. 13, '02	
Massachusetts Avenue.	Salisbury	Park Ave.		2,873.41	Dec. 30, '01	
Montreal	Wall		32.5	140.65	Oct. 13, '02	
Newton Ave.	Newton Sq.	Midland	60	312.00	" " "	
Newton Sq.				196.23	Jan. 3, '02	Relocated.
Norfolk	Wall	Ascension	50	1,372.59	Dec. 30, '01	
Noyes	Pleasant	Field	50	641.89	Jan. 3, '02	
Orne	Westminster	Windsor	40	344.48	Dec. 30, '01	
Orne	Windsor	Channing	40	339.93	" " "	
Pelham	Merrick	Russell	40	418.53	Oct. 27, '02	
Perry	Millbury		40	894.40	On file.	
Roxbury	Highland	William	50	964.33	Oct 13, '02	
Somerset	"	"	50	898.95	" " "	
So. Harding	Green			11.83	July 21, '02	Relocated.
Uxbridge	Washington Av.	Shaffner	40	1,301.11	Nov. 10, '02	
Vinson	Rodney	Stanton Ave.	40	469.62	Oct. 13, '02	
Waconah Rd.	Park Ave.	Whitman Rd.	50	546.40	Dec. 30, '01	
Wells	Plantation		40	824.15	Nov. 24, '02	
William	Sever	Russell	60	835.28	Oct. 13, '02	
Windsor	Allen Est.	Green Lane	40	965.98	" " "	
Total length				33,880.56		

SIDEWALKS FOR WHICH DECREES HAVE BEEN PREPARED.

Street.	From	To	Date of Decree.	Length in feet.	Side.
Adams	Shrewsbury		Sept. 29, '02	700.00	East
Aetna	Coral	Cutler	June 16, '02	1,159.00	North
Albert	Grand		Nov. 10, '02	275.50	North
"	"		" " "	278.30	South
Beeching	Pleasant		Oct. 27, '02	952.00	West
Burncoat	North Ave.		June 16, '02	200.00	West
Cherry	Vine	Canal	" " "	328.90	North
"	"	"	" " "	327.20	South
Cutler	Aetna	Union Ave.	" " "	611.00	East
E. Worcester	Shrewsbury	Plum	July 14, '02	1,150.00	North
"	"	"	" " "	1,150.00	South
Everett	Cedar	William	Nov. 10, '02	281.20	East
Forbes	Lincoln	Westminster	On file.	324.38	North
"	"	"	"	324.34	South
Gold St. Ct.	Assonet	Bradley	June 16, '02	352.00	West
Hackfeld Rd.	Highland	Institute Rd.	Oct. 13, '02	902.00	West
Heardsleigh	Summer	Fountain	On file.	407.58	North
"	"	"	"	407.56	South
Houghton	Grafton	Union Ave.	June 30, '02	1,354.00	West
Ledge	Water		June 16, '02	609.00	East
Midland	Newton Ave.		Oct. 13, '02	300.00	North
North Ave.	Burncoat	South Ave.	Sept. 22, '02	800.00	South
Orne	Westminster	Windsor	May 26, '02	342.30	North
"	"	"	" " "	346.70	South
"	Windsor	Channing	" " "	343.80	North
"	"	"	" " "	336.00	South
Paine	Frederick	Melville	June 30, '02	3,638.26	East
"	"	"	" " "	3,638.27	West
Park Avenue	Tufts	May	June 2, '02	1,111.20	West
" "	Salisbury	Drury Lane	" " "	713.00	West
" "	Pembroke	Maywood	June 16, '02	1,743.10	So. East
Providence	Union Ave.	Crompton Est.	" " "	540.00	East
Reeves	Greenwood	Plympton	" " "	600.80	North
"	"	"	" " "	627.70	South
South Harding	Lafayette	Endicott	July 14, '02	681.90	East
" "	"	"	" " "	687.00	West
Tuckerman	Salisbury		Nov. 24, '02	300.00	East
Vernon	Hillside	Harlem	Oct. 27, '02	1,379.00	West
Wall	Suffolk		June 16, '02	958.50	West
Westminster	Harrington Av.	Forest Ave.	July 14, '02	400.00	East
Worth	Millbury	Ward	Oct. 13, '02	418.83	North
Total length				32,000.32	

The street work for general purposes is as follows:

	Number or Length in Feet.
Curb stakes set on 55 streets,	29,140
Cross sections for estimates, 12 streets,	26,770
Grade stakes for construction, 19 streets,	19,330
Street bounds set,	133
Street bounds readjusted,	214
Line and grade given on application,	135
Locations examined and approved, for electric light conduits,	30

Locations examined and approved, for electric light poles, 325
Locations examined and approved, for gas mains, 61
Locations examined and approved, for telephone conduits, 21
Locations examined and approved, for telephone poles, 42

On the following streets, lines and grades were given for Street Railway construction:

Belmont street, Lincoln Sq. to Bell pond.
Belmont street, Shrewsbury street to Lake avenue.
Bloomingdale road, Grafton street to Plantation street.
East Worcester street, Shrewsbury street to Casco street.
Front street, Main street to Hibernia street.
Grafton street, Water street to Rice square.
Greenwood street, Millbury street to Upland street.
Hamilton street, Grafton square to Harrington way.
Main street, Exchange street to Lincoln square.
Main street, Mill street to Gates lane.
Shrewsbury street, Mulberry street to Lyon street.
Shrewsbury street, Seward street to Belmont street.

Decrees were prepared for the re-establishment of grades by the City Council on the following streets:

Street.	From	To	Length in Feet.	Remarks.
North Avenue	Near South Ave.	Easterly	400	Public
Stafford	Ludlow	Westerly	650	Public
Total length			1,050	

For renumbering the following named streets by the City Council, surveys and plans were made, and notices sent to the owners and occupants in accordance with the orders therefor:

Street.	From	To	Length in Feet.
Batchelder	Union Avenue	Jefferson	653.00
Beaver	Main	Park Avenue	2,007.30
Einhorn Road	Highland	Institute Road	825.66
Gardner	Main	Southgate	1,905.00
Hackfeld Road	Highland	Institute Road	898.06
Mott	Coral	Barclay	613.38
Orne	Paine	Channing	1,378.00
South Harding	Green	Quinsigamond Ave.	3,413.00
Webster	Cambridge	City line	6,580.00
Woodbine	Maywood	Beaver	986.26
Total length			19,259.66

Grades were established by the City Council upon 3.34 miles of private streets, the decrees for which were prepared and recorded, for the ways named below:

Street.	From	To	Length in Feet.
Arline Terrace	Whipple		384.00
Berkmans	June	Hadwen Road	635.00
Bernice	Webster		545.50
Bird	Boston Avenue		197.00
Boston Avenue	Hamilton		1,350.00
Clover Avenue	"		386.80
Commonwealth Avenue	"		1,456.00
Crawford	Commonwealth Ave.		950.00
Elton	Boston Avenue		400.00
Hamilton Avenue	Hamilton		990.50
Harrington Way	"		1,041.00
Hazel	Boston Avenue		273.00
Henry Terrace	Whipple		410.00
Howland Terrace	Pleasant		1,600.00
Highview Avenue	Jeanette		630.30
Jeanette	Harrington Way	Highview Avenue	207.60
Monroe Avenue	Pleasant	Howland Terrace	1,534.00
Middlesex Avenue	Hamilton	Robert	1,307.00
Olga Avenue	Belmont	Vinson	795.00
Otsego Road	Monadnock Road	Forest	716.00
Robert	Commonwealth Ave.	Boston Avenue	470.00
Stoneland Road	Main	Freeland	1,266.20
Total length			17,544.90

One hundred eight plans of street locations and other work pertaining to the Street Department have been made and filed. By reason of the new pavements laid in Main, School

and Mechanic streets, considerable more than the usual time and attention devoted to street work has been required. The usual schedules of measurements and amounts of work performed have been furnished, together with much other work of a general nature, and all records as required by ordinance.

Sewers.

The usual force of assistants engaged upon sewer construction has been busily employed in the preparation of plans and details incident to the work, and which is fully set forth in the report of the Superintendent of that Department.

5.50 miles of sewers in the aggregate were constructed during the year, and house drains to the number of 454, with a total length of 4 miles, were inspected and gradients provided for.

The considerations for the disposal of the sewage of Lake View were concluded and reported upon, and investigations and reports upon the sanitation and relief from storm water, for the Beaver brook valley and the Cambridge street overflows were made.

Plans were provided for the installation of the Shone system of sewage disposal for the Worcester Highlands district, and which is now building.

Plans in detail were also made for the extension of the filtration areas at the sewage disposal works at Quinsigamond, and at present under construction.

The Middle River improvements and the rebuilding of the Shrewsbury street sewer have also required the co-operation of this department.

Eighty-three plans, with duplicates, have been provided for sewer constructions during the year.

I am again constrained to call your attention to the necessity of building a suitable invert for portions of the Mill brook arch, and to renew my former recommendations.

WATER.

The dam and reservoir on Kettle brook, which is designated number 3 upon that stream, has been completed, and on December 4th the gates were closed and the filling of the basin began.

Upon the completion of the dam on Tatnuck brook during the early fall of last year, the machinery and tools employed there were transferred to Kettle brook, and preparations made to begin the construction at once. The barracks and other buildings were erected, and before closing down for the winter, the draft pipe had been placed in position and a beginning made on the general excavations. On April 21st of this year work was again begun, and as the excavations proceeded ledge was developed throughout the entire length of the structure. No material difficulties were encountered in reaching a suitable foundation, the maximum depth not exceeding 21 feet below the bottom of the draft pipe. The ledge proved of sound quality for the most part, and especially under the core wall was its character found good. A trench was excavated in the rock, into which the core wall of concrete was placed and the ends carried well into the hills upon either side.

The material of the upper portion of the dam is composed of hard pan, well rolled and tamped, with a protection of rip rap at its lower part, and a pavement of stone, laid on end, with a grout of Portland cement, for its upper part.

The spillway has a width of 34 feet and is placed at the easterly end of the dam on natural ground. The floor of the spillway is finished with granolithic, and a small foot bridge of steel and concrete spans the channel at the crest of the dam.

The length of the dam is 370 feet, and has a top width of 20 feet. The slopes of the up stream face are 2 on 1, and from the elevation of high water on the lower slope to the end of the waste channel, the gorge was filled with waste material and brought to a uniform surface. All the surfaces below the upper crest of the dam are well loamed and seeded down.

Upon land purchased by the city from the Cooper estate, all

the stone for concrete and general construction purposes was quarried, and within the basin a very good masonry sand was found. In a region lacking in these essentials, their finding was of considerable importance to the department.

The main structure was completed in the early part of September, and the force of men and teams employed in cleaning the reservoir was then increased. The basin is about 40 acres in extent, about one-half of which contained heavy deposits of mud, and there were also large areas containing stumps of a former growth of timber. The maximum number of men employed at one time was 283.

With the completion of the dam the necessary tools for beginning operations at the Mann reservoir were transferred, and a commencement made in the reconstruction and enlargement of this dam and reservoir. The plant with buildings are in readiness for an advantageous resumption of the work during the coming season.

All the reservoirs are in good condition with the exception of the one at Paxton, which should receive the attention of the City Council whenever it is deemed safe to dispense with the storage of this reservoir long enough to perform the required work.

The following table shows the monthly and annual, and the average daily and monthly consumption of water, in gallons, for the fiscal year.

Months.	Consumption per Month.	Average Monthly Consumption.	Average Daily Consumption per Month.	Average Daily Consumption the Year.
December	233,495,680		7,532,119	
January	246,952,200		7,966,200	
February	215,418,916		7,693,533	
March	233,159,080		7,521,261	
April	230,039,920		7,667,997	
May	249,659,960		8,053,547	
June	255,651,440		8,521,715	
July	275,533,280		8,888,170	
August	259,204,440		8,361,433	
September	250,609,920		8,353,664	
October	263,587,720		8,502,830	
November	241,304,800		8,043,493	
Total	2,954,617,356	246,218,113		8,094,842

The maximum consumption of water for one day amounted to 11,451,880 gallons.

Average daily gallons per capita of water users, 68.

MISCELLANEOUS.

The protracted hearings relative to the abolition of grade crossings between Union station and Cambridge street, together with the preparations of plans and estimates, have occupied the attention of the department to a considerable extent, eleven different plans having been made for the purpose.

One additional volume of plans of estates has been completed for the Assessors' use, and much additional data procured for that department.

The number of separate plans made during the year for all purposes amount to 250.

For the Public Buildings Department, Hope Cemetery, and work of a general nature, the requests upon the department have been about as usual.

To my assistants of the department, who have rendered valuable and efficient service, my appreciation is acknowledged.

Respectfully submitted,

FRED'K A. McCLURE,

City Engineer.

ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR AND THE CITY ENGINEER,

OF THE

CITY OF WORCESTER,

FOR THE

YEAR ENDING NOVEMBER 30, 1903.

Worcester, Mass.:
THE BLANCHARD PRESS,
34 FRONT STREET.
1904.

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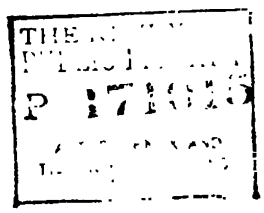
OF THE

CITY OF WORCESTER,

FOR THE

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WATER COMMITTEE.

Alderman EDW. D. CUNNINGHAM,
Alderman JULIAN F. BIGELOW,
Alderman JOHN H. MEAGHER,
Councilman EDW. S. CLARK,
Councilman NORMAN B. PARSONS,
Councilman HERBERT A. BOOTH,
Councilman JOHN J. POWER.

WATER COMMISSIONER.

JOHN G. BRADY.

WATER REGISTRAR.

GEO. W. BATCHELDER.

REPORT OF WATER COMMISSIONER.

To the Honorable City Council of the City of Worcester.

Gentlemen:—In compliance with the requirements of the City Ordinances, I herewith respectfully submit the following report for the year ending November 30, 1903:

Reservoirs.

All necessary repairs to buildings and grounds have been made, and all are in excellent condition at the present time.

Construction.

The appropriation for this account has not been sufficient for the last few years to complete all the work ordered during the year.

I am of the opinion if the city would provide sufficient funds to supply all reasonable demands for pipe extension, it would prove to be a good investment.

Pipe Lines.

The system of distribution has been extended 3.817 miles during the year, making a total of 184.737 miles of main pipe now in use.

Summary of Statistics.

Dates of construction: 1845, 1864, 1883, 1893, 1895, 1896, 1900, 1901, 1902, 1903.

Source of supply: Impounding reservoirs in the towns of Leicester, Paxton and Holden.

Mode of supply: Gravity.

Capacity of reservoirs, 2,399,827,789 gallons.

Average pressure: High service, 150 pounds; low service, 70 pounds.

Number of miles main pipe, 2 inches to 40 inches diameter, 184.737.
Number of miles service pipe, 129.142.
Number of fire hydrants, 1902.
Number of water gates, 2704.
Number of water meters, 13,386.
Total cost of works to date, Dec. 1, 1903, $4,043,784.79.

Recommendations.

First. As the daily consumption of water has increased far in excess of that warranted by the increase in population, and in order to regulate and account for a larger percentage of the amount delivered into the city, I desire to renew my recommendation of last year, that all large supplies furnished individuals and corporations be metered.

Second. That the use of high service pressure for elevators be discontinued after January, 1904.

Third. That stand pipes be provided for street sprinkling cars, instead of allowing the supply to be taken from fire hydrants.

Fourth. The necessity of larger appropriations, in order to extend the water service in growing sections of the city.

I desire to call attention to the need of an electrical department, having charge of all questions of an electrical engineering nature, as is the case in many cities, and competent to deal directly with all questions of an electrical nature, which, in a city like Worcester, are arising from time to time, and possibly might arise with greater frequency were there such a department to which questions relating to electrolysis, etc., might be referred.

As questions relating to this matter will multiply rapidly as the municipal applications of electricity become more and more frequent, I have no doubt that if such a department were established in our city in the near future, it would be of great service to the Water Department, as well as to the other departments of the city.

Thirty-five fire hydrants have been set during the year. The total number now in service for fire protection is 1902. Of this

number 196 are on the premises of individuals and corporations.

Number of water cart hydrants in use,	122
Number of car sprinkling hydrants in use,	39
Number of drinking fountains in use,	9
Number of watering troughs in use,	18

ELEVATION OF RESERVOIRS ABOVE MAIN STREET AT CITY HALL.

KETTLE BROOK RESERVOIR NO. 1.

Rollway, 364.36 feet.

KETTLE BROOK RESERVOIR NO. 2.

Rollway, 507.5 feet.

KETTLE BROOK RESERVOIR NO. 3.

Rollway, 559.00 feet.

KETTLE BROOK RESERVOIR NO. 4.

Rollway, 601.74 feet.

LYNDE BROOK RESERVOIR.

Rollway, 341.94 feet.

PARSONS' RESERVOIR.

Rollway, 237.80 feet.

HOLDEN STORAGE RESERVOIR NO. 1.

Rollway, 269.88 feet.

HOLDEN RESERVOIR NO. 2.

Rollway, 237.80 feet.

HOLDEN DISTRIBUTING RESERVOIR.

Rollway, 177.00 feet.

Elevation of Main Street at City Hall above tide water, 481 feet.
Water pressure at City Hall, low service, 70 pounds.
Water pressure at City Hall, high service, 150 pounds.

In addition to the service pipes, which are reported in tabulated form, there have been forty-one (41) service pipes changed, for which 695 feet of pipe was used in the streets and 997 feet on the premises of the owners.

Five thousand and seventy (5,070) feet of temporary mains have been laid, the persons thus supplied paying the expense of trenching and laying and for pipe exceeding 100 feet.

The following tables will show rainfall at the reservoirs, sizes of pipe laid, also number of gates and hydrants set during the year:

TABLE

Showing the daily height of water in HOLDEN RESERVOIR and the rainfall for the year ending November 30, 1903.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	22.78	.16	30.25		30.33		30.58		30.28		31.26		29.78		31.50	.04	30.77		30.10		28.48		28.38	
2	22.82		30.25	.56	30.26		30.27		30.09		31.22		29.73		31.48		30.76		30.03		28.37	.08	28.43	
3	22.86	.52	30.27		30.21	.17	30.19		30.08	.27	31.15		29.66		31.43		30.63		30.00		28.33		28.43	
4	22.93		30.28		30.28	.72	30.12		30.05	.16	31.18	.08	29.54		31.31		30.52	.10	29.95		28.25		28.18	
5	22.90	.24	30.30		30.37	.31	30.11	.16			31.15		29.42		31.22		30.73	1.88	29.90	.10	28.22	.20	28.23	.34
6	22.88		30.28	.13	30.28		30.03		29.98		31.13	.06	29.33		31.21	.46	30.89	.15	29.83		28.17		28.28	
7	22.88	.36	30.25	.03	30.24		29.95		29.95	.22	31.15	.20	29.22	.02	31.28		30.96	.08	29.82		28.13		28.17	.07
8	22.88		30.23	.14	30.22	.43	29.87	.53	30.04	.84	31.18		29.18	.20	31.20		30.96		29.77		28.03	.25	28.12	
9	22.93		30.20		30.26		30.50	1.25	30.63	.62	31.08		29.04		31.10		30.95		29.63		28.07	.67	28.08	
10	23.04	.05	30.23		30.23		30.48	.06	30.34	.02	31.10		29.03		31.18		30.94	.01	29.60		28 28	.25	28.02	
11	23.09		30.21		30.23		30.58	.72	30.25		31.10		29.19	.78	30.96		30.90		29 48		28.26	.48	28.01	
12	23.19	.30	30.21	.50	30.37	.62	30.41		30.18		31.14		29.22	2.37	30.88		30.90	.02	29.44			.75	28.00	
13	23.26	.34	30.21		30.37		30 13		29.98		31.18		29.87	.64	31.01	1.31	30.89		29.39		28.47	.04	27.97	
14	23.37	.71	30.21		30.33		30.02		30.13		31.20		29.98	.05	31.02	.02	30.79		29.32		28.41		27.93	
15	23.48		30.21		30.27		30.08		30 21	.66	31.17	.24	30.10	2.10	31.01		30.73		29.30		28.35		27.91	
16	23.67	.89	30.21		30.25		29.95		30.56	.13	30.98		31.04	.31	30.98	.09	30.64		29.28	.05	28.30		27.93	.45
17	24.36	.67	30.21		30.21	1.03	29.93		30.71	.03	30.93		31.22		30.93		30.64	.05	29.31	1.36	28.16	.22	28.08	1.33
18	24.91		30.21		30.20		29.92		31.03		30.90		31.32	.11	30.70	.04	30.53		29.29	.04	28.53	.75	28.52	.32
19	25.18		30.20		30.18		29.92		31.01		30.93	.21	31.41		30.96	1.23	30.48		29.23		28.49	.04	28.50	
20	25.36		30.18		30.17		29.92		31.08		30.82		31.44	.02	30.90	.41	30.35	.31	29.21		28.53		28.49	
21	25.63	.27	30.23	1.09	30.14		30.07	.18	31.13		30.72		31.72	3.08	30.96	.09	30.34		29.19		28.55		28.48	
22	26.93	1.78	30.26		30.19		30.20	.49	31.20		30.63		32.25	.18	31.05	.47	30.33		29.19		28.56		28.50	
23	28.09		30.21		30.20		30.29	1.65	31.23		30.53		31.95		31.14		30.30		29.19		28.61	.13	28.53	.12
24	28.53		30.12		30.22		30.58	.41	31.25		30.36		31.84		31.21		30.22		29.18		28.63	.15	28.55	.02
25	28.89		30.18	.11	30.23		30.38	.04	31.25		30.28		31.79	.11	31.13		30.15	.76	28.86		28.53		28.53	
26	29.31	.54	30.20		30.22		30.20		31.26		30.18		31.65		31.05		30.26	.08	28.78		28.57		28.53	
27	29.43	.01	30.22	.05	30.22		30.19		31.26		30.05		31.70		31.02		30.20		28.70	.02	28.49		28.51	
28	29.69		30.17		30.16	.66	30.15	.09	31.26		29.96	.41	31.61		31.00		30.14		28.65	.71	28.43		28.45	
29	29.91		30.18				30.23	.11	31.26		29.93		31.58	.18	30.82		30.11	.37	28.59		28.38		28.41	
30	30.06	.27	30.20	.50			30.18		31.26		29.90	.04	31 53		30.83	.30	30.12	.31	28.53		28.38		28.36	
31	30.21		30.29				30.38	1.19			29.84				30.81	.02	30.13	.19			28.43			
Totals,		7.11		3.11		3.94		6.83		2.95		1.24		10.10		4.48		4.31		2.28		4.01		2.65

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway, 30.10 feet. Rainfall for the year ending November 30, 1903, 53.01 inches.

TABLE

Showing the daily height of water in LYNDE BROOK RESERVOIR and the rainfall for the year ending November 30, 1903.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	27.13	.14	32.96		36.76		38.50		38.28		37.95		36.23		37.93	.05	37.69		34.50		31.22		30.70	
2	27.16		32.94		36.87		38.28		38.16		37.87		36.09		37.81	.02	37.54		34.38		31.04	.05	30.58	
3	27.20	.50	33.08	.60	37.00	.15	38.15		38.15	.27	37.76		36.02		37.76		37.30		34.21		30.87	.04	30.41	
4	27.32	.04	33.40	.01	37.07	.80	38.08		38.14	.16	37.75	.09	35.90		37.58		37.13		34.20		30.90		30.38	
5	27.40		33.65		37.94	.18	38.05		38.08		37.70		35.85		37.80		37.13	2.23	34.52	.29	30.78	.12	30.20	.29
6	27.42	.74	34.04	.15	38.11		38.11	.12	38.04		37.64	.05	35.74		38.12	.36	37.50	.03	34.40		30.78		30.13	
7	27.45	.23	34.28	.17	38.09		38.05		38.00		37.57	.18	35.70	.01	38.05		37.59	.18	34.70		30.70		30.05	.04
8	27.50		34.50		38.10	.17	38.15	.32	38.08	.34	37.56		35.65	.07	37.90		37.49		34.77		30.82	.14	29.96	
9	27.47		34.70		38.10	.31	38.58	1.28	38.46	1.30	37.56		35.65	.10	37.82		37.38		34.70		30.94	.63	29.84	
10	27.42	.07	34.78		38.08		38.47	.15	38.29	.02	37.56		35.60	.02	37.60		37.33	.02	34.50		31.25	.07	29.65	
11	27.32		34.85		38.07		38.32	.66	38.18		37.63		35.71	1.17	37.64		37.28		34.33		31.36	.34	29.50	
12	27.25	.25	35.03	.61	38.32	.55	38.38		38.10		37.68		35.71	2.24	37.58	1.07	37.05	.02	34.09		31.26	.45	29.37	
13	27.18	.18	35.30		38.28		38.22		38.08		37.68		36.51	.70	37.94	.60	36.90		33.82		31.30	.48	29.20	
14	27.13	.97	35.45		38.17		38.15		38.05		37.63		36.90	.12	37.92		36.78		33.70		31.26		29.08	
15	27.06		35.65		38.09		38.12		38.05	.15	37.55	.24	36.97	1.86	37.82	.01	36.54		33.55		31.06		28.88	
16	27.00	.37	35.70		38.12	.67	38.06		38.17	.81	37.38		38.11	.39	37.66		36.48		33.35		31.00		28.68	
17	27.71	1.03	35.67		38.11	1.04	38.08		38.16	.06	37.15		38.30		37.64		36.37	.07	33.30	1.26	31.06		28.78	1.12
18	28.57		35.60		38.04	.07	38.04		38.11		37.08		38.40	.08	37.78		36.14		33.27	.06	31.50	.95	29.12	.88
19	28.77		35.50		38.00		38.02		38.00		37.00		38.27	.02	38.00	1.36	35.98		32.98		31.65	.04	29.75	
20	28.88		35.45		37.98		38.00		38.00		36.95		38.11	.02	38.25	.01	35.79	.43	32.87		31.52	.01	29.85	
21	28.90		35.45	1.20	37.91		38.00		37.98		36.95		38.12	3.21	38.08	.48	35.73		32.76		31.36		30.30	
22	30.60	2.03	35.79		37.90		38.05	.44	37.94		37.00		38.80	.12	38.00	.51	25.60		32.57		31.25		30.54	
23	32.14		35.87		37.85		38.20	.95	37.90		36.94		38.40	.02	38.00		35.48		32.38		31.15	.12	30.50	
24	32.42		35.90		37.82		38.62	1.38	37.88		36.87		38.20		37.94		35.35		32.20		31.27	.13	30.40	.09
25	32.60		35.95	.13	37.79		38.36		37.96		36.75		38.11	.11	37.70		35.18	.55	32.10		31.36		30.25	
26	32.70	.61	35.97	.02	37.75		38.19		38.00		36.65		38.05		37.80		35.09	.14	31.90		31.35		30.15	
27	32.85	.02	35.97		37.68		38.13		38.00		36.60		38.05		38.00		34.98		31.70		31.34		30.00	
28	32.93		35.97	.02	37.82	.52	38.11	.07	38.05		36.50	.27	38.00		38.05		34.85		31.60	.45	31.30		29.90	
29	32.98		36.15	.01			38.08	.08	38.02		36.46		38.00		38.09		34.70	.40	31.54		31.15		29.80	
30	33.02	.14	36.22	.51			38.07		38.00		36.40	.01	37.93	.22	38.00	.18	34.64	.04	31.40		31.10		29.65	
31	33.00		36.60				38.32	1.25			36.26				37.85	.02	34.64	.45			30.96			
Totals,		7.32		3.43		4.46		6.70		3.11		.84		10.48		4.67		4.56		2.06		3.57		2.42

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway, 37.40 feet.
Rainfall for the year ending November 30, 1903, 53.62 inches.

LENGTH AND SIZE OF NEW PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1903.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		Size in Inches.	Length in Feet.			
Cristy,	From Grand street, westerly,	8	195	1		Low.
Dewey,	" May to Charlotte street,	12	1047	1	3	"
Duncan avenue,	" Cambridge street, westerly,	8	995	1	4	"
Ellsworth,	" end of pipe, westerly,	6	412	1	1	"
Endicott,	" end of pipe to Bigelow street,	6	258	1	1	"
Exchange,	" Union street to B. & M. R. R. location,	12	228	1	2	"
Forest,	" Salisbury street, northerly,	12	52	3	4	High.
		16	1312			"
Harlow,	" end of pipe easterly,	8	301			"
Millbury avenue,	" Heywood street, southerly,	12	44			"
		16	2100	2	5	"
Monroe avenue,	" end of pipe westerly,	6	272		1	"
Pelham,	" Merrick to Russell street,	8	461	1	2	Low.
		12	63			"
Regent,	" Salisbury to Drury lane,	8	793	1	3	High.
Salisbury,	" end of pipe northerly,	6	2315	2	2	"
Shannon,	" Union avenue, westerly,	8	653	1	2	"
		16	84			"
South,	" Providence to Chapin street,	8	477	2	1	"
Southbridge,	" Hope avenue to Tracy place,	8	320	1	1	"
Stafford,	" end of pipe westerly,	16	1372	1	2	Low.
Stoneland road,	" end of pipe to Freeland street,	12	794	2		"
Webster,	" Knox street to city line,	8	950	1	1	"
Wildwood avenue,	" Apricot street, northerly,	12	1100	2		High.
			16,598	25	35	

LENGTH AND SIZE OF PIPE RELAID DURING THE YEAR ENDING NOVEMBER 30, 1903.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		Size in Inches.	Length in Feet.			
Bond,	From Fairmont avenue, southerly,	2	2058			High.
Cherry,	" Bartlett to Canal street,	12	472			Low.
East Worcester,	" Shrewsbury to Lyon street,	8	194			"
		12	1207	1	5	"
Market,	" Main to Summer street,	12	844	1	4	"
Sargent,	" Gold to Lamartine street,	8	331		1	"
Sutton lane,	" Fremont street to Hopeville Mfg. Co.,	12	868	2		High.
Warren,	" Front to Cherry street,	12	264	1	3	Low.
			6238	5	13	

TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1903.

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1903,	10,317	98	78,214	250,339	203,363	18,564	165,944	14,094	109,355	500	29,526	27,990	25,113	6,134	15,743	180.920	1,867	2,656
Laid in 1903,	2,058			3,257	5,670		6,983		4,868							4.325	35	48
Total,	12,375	98	78,214	253,596	209,033	18,564	172,927	14,094	114,223	500	29,526	27,990	25,113	6,134	15,743	185.245		
Pipe taken up 1903,			912	1,775												.508		
Total feet,	12,375	98	77,302	251,821	209,033	18,564	172,927	14,094	114,223	500	29,526	27,990	25,113	6,134	15,743		1,902	2,704
Total miles,	2.343	.018	14.64	47.693	39.589	3.515	32.751	2.669	21.633	.095	5.592	5.301	4.756	1.161	2.981	184.737		

SERVICE PIPES LAID TO NOVEMBER 30, 1903.

	In the Street.		Premises of Individuals.		No.
	Feet.	Miles.	Feet.	Miles.	
Prior to 1887	171,603.36	32.498	188,386.48	35.676	7,629
1887	9,674.	1.832	11,418.25	2.162	469
1888	8,814.75	1.669	13,872.	2.627	431
1889	10,021.75	1.898	11,264.5	2.133	472
1890	9,300.58	1.761	13,972.9	2.644	449
1891	9,307.5	1.762	14,276.66	2.704	483
1892	10,012.58	1.896	12,803.25	2.424	506
1893	8,616.25	1.631	11,064.	2.095	430
1894	7,218.	1.367	11,035.	2.09	366
1895	7,469.	1.414	12,407.	2.35	366
1896	7,067.83	1.34	8,796.	1.66	346
1897	8,324.11	1.576	9,805.2	1.857	383
1898	7,291.	1.38	12,878.75	2.439	342
1899	7,234.25	1.37	12,134.	2.298	336
1900	6,047.25	1.126	8,241.50	1.56	284
1901	6,506.75	1.232	7,291.25	1.38	315
1902	4,604.	.872	7,255.	1.374	225
1903	6,027.	1.141	10,054.	1.904	297
	305,139.96	57.765	376,955.74	71.377	14,129

WATER-CART HYDRANTS, 1903.

Ætna,	Near Coral St., 10′ 6″ out from stand pipe.
Austin,	24′ 6″ W. of W. line of Queen St., 11′ 6″ out from stand pipe.
Benefit,	59′ 7″ E. of E. line of Beacon St., 15′ 10″ S. of N. line of street, 26′ 6″ out from stand pipe.
Bloomingdale Road,	104′ E. of E. line of Grafton St. (S.), 15′ 9″ N. of S. line of street, 22′ out from stand pipe.
"	7′ 8″ out from stand pipe.
Bowdoin,	13′ E. of E. line of Chestnut St., 5′ N. of stand pipe.
Bridge,	36′ 6″ W. of W. line of viaduct wall (S.), 20′ 4″ out from stand pipe.
Burncoat,	21′ E. of W. line of street, 18′ 9″ N. of N. line of Melville St.
Cambridge,	12′ 6″ S. of N. line of street, 3′ 6″ E. of W. line of Southbridge St.
"	11′ 6″ out from stand pipe.
"	16′ 9″ S. of N. line of street, 25′ E. of E. line of Douglas St.
" cor. Douglas,	15′ S. of N. line of street, 25′ E. of E. line of Douglas St.
Carroll,	7′ out from stand pipe.
Chandler,	43′ 6″ W. of W. line of Newbury St., 20′ 9″ out from stand pipe.
" near Park Ave.,	30′ W. of W. line of Park Ave., 7′ 3″ out from stand pipe.
" " Bellevue,	16′ E. of W. line of Wright's new machine shop, 24′ 8″ N. of stand pipe.
Chatham,	75′ 6″ E. of E. line of Houchin Ave., 12′ out from stand pipe.
Commercial,	20′ S. of N. line of Central St., 18′ E. of W. line of Commercial St.
Congress,	51′ 6″ W. of W. line of Crown St., 18′ out from stand pipe.
Crescent,	23′ 8″ out from stand pipe.
Crown,	4′ 4″ out from stand pipe.
Eastern Ave.,	Near Belmont St., 19′ 10″ out from stand pipe.
E. Central, n. Ford,	28′ 2″ out from stand pipe.
Elm,	North side, about 100′ W. of Chestnut St. and about 12′ E. of elm tree, 9′ 2″ out from stand pipe.
Florence,	8′ 7″ out from stand pipe.
"	25′ N. of N. line of Charlotte St., 16′ E. of W. line of Florence St.
"	20′ 5″ S. of S. line of May St., 26′ 10″ out from stand pipe.
Foster,	12′ 8″ out from stand pipe.
Front,	63′ 7″ W. of W. line of Church St., 64′ N. of stand pipe.
Fruit, near Dayton,	7′ out from stand pipe.
Garden,	54′ 3″ W. of W. line of Lincoln St., 19′ 6″ N. of S. line of Garden St., 23′ 9″ out from stand pipe.
Gold,	East side, about 30′ S. of catch-basin, south side of Bradley St., 20′ out from stand pipe.
Grand,	16′ 6″ E. of E. line of Illinois St., 26′ 6″ out from stand pipe, 5′ 9″ out from stand pipe.
" near Douglas.	8′ 10″ out from stand pipe.
Green,	27′ 8″ N. of S. line of Crompton's shop, 14′ 4″ out from stand pipe.
Grove,	49′ S. of S. line of Lexington St., 34′ 3″ out from stand pipe.
"	End of wire mill, 7′ 9″ out from stand pipe.
"	Near North St., 8′ 6″ out from stand pipe.
Hancock,	14′ W. of W. line of Hollis St., 8′ out from stand pipe.
Hermon,	14′ 4″ from S. line of barn wall on N. W. corner Southbridge and Hermon Sts., 30′ 2″ W. of E. line of barn.
"	8′ 10″ S. of stand pipe.
"	9′ 6″ S. of N. line of Hermon St., 27′ E. of E. line of Main St.
Highland,	7′ 9″ out from stand pipe.
"	14′ W. of W. line of Boynton St., 10′ 3″ S. of stand pipe.
"	43′ E. of E. line of Westland St., 22′ 9″ out from stand pipe.
"	31′ 6″ out from stand pipe.
"	Near Newton Sq., 32′ 6″ out from stand pipe, 1′ 6″ E. of centre of stand pipe. 2″ drip valve to above stand pipe, 7′ out from stand pipe.
Hollywood	S. of May St., 6′ 10″ out from stand pipe.
Home,	North side, front of school-house lot, opposite end of Wesby St., 6′ 8″ out from stand pipe.
Hudson,	59′ 6″ S. of S. line of Elm St., 26′ out from stand pipe.
Institute Road,	Near Beechmont St., 3′ 4″ out from stand pipe.
" "	Near West St., 2′ 6″ out from stand pipe.
Jaques Ave.,	West side, between two trees front of school-house lot, 8′ 6″ out from stand pipe.
King,	17′ W. of W. line of Queen St., 24′ out from stand pipe.
"	¾″ Stop, 17′ 9″ W. of W. line of Queen St., 22′ 3″ out from stand pipe. 7′ 10″ out from stand pipe.
Lafayette,	13′ S. of N. line of street, 31′ W. of W. line of Quinsigamond Ave. ¾″ Stop, 11′ 2″ S. of N. line of street, 32′ W. of W. line of Quinsigamond Ave.
Lagrange,	50′ S. of S. line of Beacon St., 20′ out from stand pipe.
Lake,	19′ 9″ out from stand pipe.
Lancaster,	14′ S. of S. line of Institute Rd., 27′ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

Lincoln,	10′ 9″ N. of N. line of Perkins St., W. of Lincoln St., 14′ out from stand pipe.
Lodi,	4′ 3″ out from stand pipe.
Madison,	7′ 2″ W. of W. line of Southbridge St., 22′ 8″ out from stand pipe.
Main,	At Hammond St., 7′ W. of stand pipe.
"	22′ 9″ W. of E. line of Main St., 35′ N. of N. line of Gertrude Ave.
"	Near Grand St., 34′ N. of N. line of Downing St., 53′ E. of W. line of Main St., 3′ 6″ W. of stand pipe.
"	Opp. Marble St., 9′ 3″ out from stand pipe.
"	Near Park St., 25′ S. of stand pipe on branch of two-way hydrant, 1′ 8″ W. of E. line of curbstone.
"	11′ 7″ N. of N. line of Park St. [pipe.
"	Near University Park, 9′ N. of stand pipe, 2′ 10″ out from stand
Mill,	13′ 6″ N. of N. line of Quinn's block, 27′ out from stand pipe.
Millbury,	Near the mill, 1′ 9″ W. of stand pipe, 2′ out from stand pipe.
"	Near Seymore St., 10′ W. of E. line of street, 13′ 9″ S. of N. line of Seymore St.
"	Near Greenwood St., 6′ N. of stand pipe.
"	Below the ledge, 2′ 6″ N. of stand pipe.
"	S. of Cambridge St., 13′ 3″ W. of E. line of street, 62′ 9″ N. of N. line of Whitney St.
Merrick,	107′ S. of S. line of Davis Ct., 7′ out from stand pipe.
Mulberry,	15′ E. of W. line of street, 27′ 3″ N. of N. line of Asylum St., 22′ 6″ out from stand pipe.
Newbury,	East side, opposite division fence north of Austin St., 6′ 9″ out from stand pipe. [(W.).
Oak Ave.,	18′ 9″ E. of W. line of avenue, 26′ N. of N. line of Belmont St.
Orange,	East side, near Myrtle St., 6′ S. of electric light pole, 5′ 9″ out from stand pipe.
Orient,	3″ valve, 21′ N. of N. line of Hamilton St., 18′ 8″ E. of W. line of Orient St. [ton St.
	¾″ stop, 17′ 6″ E. of W. line of street, 22′ 3″ N. of N. line of Hamil-
Oxford,	15′ S. of S. line of Pleasant St., 8′ out from stand pipe.
Paine,	Near Perkins St., 8′ out from stand pipe.
"	Near Vinton St., 9′ 6″ out from stand pipe. [Ave.
Park Ave.,	Box on Lovell St., 28′ 3″ S. of stand pipe, 12′ E. of W. line of Park
" "	7′ out from stand pipe.
" "	98′ 6″ N. of N. line of house No. 194 Park Ave., 18′ 10″ out from stand pipe.
Penn Ave.,	15′ 9″ E. of W. line of avenue, 20′ 4″ S. of S. line of avenue.
Piedmont,	83′ 6″ N. of N. line of Brigham St., 22′ out from stand pipe.
Plantation,	13′ 8″ N. of N. line of Shrewsbury St., 9′ 8″ W. of E. stone wall corner of Shrewsbury and Plantation Sts.
	26′ 4″ N. W. from stand pipe.
Pond,	Corner Harding St., 7′ 9″ out from stand pipe.
Prescott,	2′ 6″ out from stand pipe.
"	Above wire mill, 9′ 10″ out from stand pipe.
"	Near North St., 21′ out from stand pipe.
Richards,	8′ out from stand pipe.
Salisbury,	18′ 6″ W. of W. line of Dean St., 7′ out from stand pipe.
"	Corner Park Ave., 8′ 10″ out from stand pipe.
Sheridan,	Box on Shrewsbury St., 27′ N. of S. line of street, 12′ E. of W line of Sheridan St.
Shrewsbury,	12′ 3″ N. of S. line of Shrewsbury St., 18′ W. of W. line of school-house fence.
Sigel,	66′ 6″ W. of W. line of Harding St.
Southbridge,	Near Prov. & W. R. R., 9′ 3″ out from stand pipe.
Southgate,	26′ 9″ W. of W. line of Southbridge St., 24′ 6″ out from stand pipe.
Sturgis,	South side, opposite greenhouse, about 200 feet from Lincoln St., 20′ 5″ out from stand pipe.
Summer,	17′ 3″ E. of W. line of street, 66′ 6″ S. of S. line of Central St.
Sycamore,	South side, in front of school-house lot, 16′ 6″ out from stand pipe.
Tainter,	Near Kilby St. 23′ 6″ W. of W. line of Tainter St., 21′ 6″ out from stand pipe. [barn.
Temple,	29′ 8″ S. of N. line of street, 22′ 10″ E. of W. line of Jourdan's
Tufts,	West side, near division fence, N. of No. 2, 7′ out from stand pipe.
Vernon,	21′ 9″ E. of E. line of Richland St., 10′ 6″ out from stand pipe.
Wall,	Near Norfolk St., 26′ out from stand pipe.
Ward,	3′ 6″ out from stand pipe.
"	19′ 6″ W. of W. line of Wade St., 17′ 6″ out from stand pipe.
Washington,	21′ 6″ N. of N. line of Plymouth St., 15′ 10″ W. of E. line of Washington St. [Plymouth St.
"	¾″ stop, 21′ 6″ N. of N. line of Plymouth St., 17′ 6″ W. of E. line of 19′ 3″ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

Water,	8′ 9″ out from stand pipe.
Waverley,	North side, 6′ E. of third tree west of Coral St., 8′ 10″ out from stand pipe.
Westminster,	7′ 6″ out from stand pipe.
William,	7′ out from stand pipe.
"	7′ 3″ out from stand pipe.
Windsor,	N. of Harrington Ave., 19′ out from stand pipe.
Winslow,	15′ 9″ S. of S. line of Pleasant St., E. of Winslow St., 22′ out from stand pipe.
Winthrop,	Near Providence St., 6′ 3″ N. of stand pipe.
Woodland,	12′ 10″ N. of S. line of school-house lot, 6′ 10″ out from stand pipe.
"	Near Downing St., 2′ 8″ out from stand pipe.

CAR SPRINKLING HYDRANTS.

Belmont,	22′ 6″ S. of N. line of street, 36′ W. of W. line of Oak Ave.
Boynton,	17′ 4″ E. of W. line of street, 39′ N. of N. line of Highland St.
Burncoat,	14′ 6″ E. of W. line of street, 94′ S. of S. line of engine house.
E. Worcester,	At Shrewsbury St., 3′ 3″ S. of S. line of Shrewsbury St., 14′ 4″ E. of W. line of Norcross Bros.' office.
Franklin Sq.,	35′ W. of E. line of Main St., 14′ N. of S. line of Allen Ct.
Fremont,	21′ 6″ S. of N. line of street, 74′ E. of E. line of house No. 22.
Grafton,	22′ N. of S. line of street, 1′ E. of E. line of Houghton St.
"	51′ 4″ W. of E. line of Grafton St., 14′ S. of N. line of Keese St.
Grove,	Near North St., 29′ S. of S. line of North St., 17′ 6″ W. of E. line of Grove St.
Highland,	12′ 4″ S. of N. line of street, 14′ W. of W. line of 162 Highland St.
June,	17′ W. of E. line of June St., 56′ N. of N. line of Chandler St., looking west.
Lincoln,	24′ W. of E. line of street, 14′ 2″ S. of N. line of Perkins St.
Main,	16′ 7″ W. of E. line of street, 11′ 3″ N. of N. line of Beaver St.
"	39′ 4″ N. of S. line of street, 88′ W. of W. line of McMullen lot 14.
"	20′ S. of N. line of Main St., 86′ 6″ E. of E. line of Lake St.
"	31′ N. of S. line of street, 5′ 6″ W. of W. line of ell part of house 1482 Main St.
"	19′ W. of E. line of street, 23′ S. of S. line of Hammond St.
Mill,	18′ W. of E. line of street, 31′ N. of N. line of Main St.
Millbury,	N. of Sigel St., 6″ gate on hydrant will shut this off.
"	26′ W. of E. line of street, 10′ N. of S. line of Maxwell St.
"	11′ 6″ W. of W. line of street, 15′ S. of N. line of Perry St.
Park Ave.,	21′ W. of E. line of Park Ave., 76′ S. of S. line of Fern St.
" "	23′ 8″ W. of E. line of Park Ave., 39′ N. of S. line of Harrington & Richardson shop.
Pleasant,	15′ S. of N. line of street, 9′ 6″ E. of W. line of 137 Pleasant St.
"	19′ 6″ S. of N. line of street 32′ 9″ W. of W. line of Park Ave.
"	20′ S. of N. line of street, 151′ W. of W. line of 414 Pleasant St.
"	3″ valve, 18′ W. of E. line of Pleasant St., 3′ 6″ S. of N. line of Wetherell's farm house.
Providence,	107′ S. of N. line of S. pier to Crompton's driveway, 20′ 3″ E. of W. line of Providence St.
Salem,	34′ 6″ S. of S. line of Front St., 26′ 6″ W. of E. line of Salem Sq.
Salisbury,	19′ W. of E. line of street. 22′ 8″ N. of N. line of Lincoln Sq. This gate shuts to the right.
"	3″ valve, 36′ 6″ E. of E. line of Park Ave., 19′ S. of N. line of Salisbury St.
Shrewsbury,	115′ S. of N. line of Hunt St., 20′ W. of E. line of Shrewsbury St.
Southbridge,	426′ 6″ S. of N. line of Lafayette St., 17′ 6″ W. of E. line of Southbridge St.
Summer,	17′ E. of W. line of street, 29′ S. of S. line of Prospect St.
Vernon,	18′ 8″ W. of E. line of street, 24′ S. of S. line of Union Ave., looking west.
Washington Sq.,	43′ 6″ W. of W. line of Summer St., 40′ 8″ N. of S. line of Front St.
Webster,	3′ 8″ E. of E. line of street, 9′ 2″ N. of S. line of Jacques St.
West Boylston,	Near Fair Grounds, 1′ S. of S. rail in center of turn-out near Fair Grounds.
" "	Near Huntington Ave., 16′ W. of E. line of W. Boylston St., 52′ S. of S. line of Huntington Ave.

DRINKING FOUNTAINS.

Belmont,	Cor. Plantation St., 24′ E. of W. line of Plantation St., 3′ 4″ N. of S. line of Belmont St.
Cambridge Sq.,	On Millbury St., 30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
Franklin Sq.,	14′ 3″ E. of E. line of Scott's block, 20′ 3″ N. of N. line of same.
Front,	Cor. Salem Sq., 65′ 6″ from base of fountain, 42′ 9″ W. of W. line of Church St.
"	Cor. Summer St., on Summer St., 26′ E. of W. line of street, 8′ 8″ N. of N. line of Front St.
Lincoln Sq.,	Cor. Main St., shut off on sidewalk.
Millbury,	Cor. Reeves St., 1′ 6″ W. of W. line of Millbury St., 27′ 9″ S. of N. line of Reeves St.
Vernon Sq.,	22′ 4″ S. of N. line of Vernon St., 8′ S. of N. line of house 108 Water St., 8′ E. of W. line of Water St.
Webster Sq.	30′ 9″ N. of S. line of Cambridge St., 25′ 6″ W. of W. line of Webster St.

WATERING TROUGHS.

Adams Sq.,	20′ W. of E. line of Lincoln St., on S. line of Shattuck St.
Belmont,	At Lake, 11′ 6″ S. of S. line of Belmont St., 34′ 7″ E. of W. line of Lake Ave.
Chadwick Sq.,	29′ S. of hydrant, 35′ 6″ E. from watering trough. [St. W.
Chandler,	10′ 2″ E. of W. line of Bellevue St., 16′ 8″ S. of N. line of Chandler
"	31′ 6″ N. of S. line of Chandler St., 6′ 9″ E. of W. line of Mill St.
Coes Sq.,	11′ 4″ W. of E. line of street, 19′ N. of N. end of parapet wall, 42′ 10″ S. of S. line of Coes' shop, 56′ 8″ S. of S. line of Beaver St.
Grafton,	Cor. Hamilton St., 16′ 5″ S. of N. line of street, 32′ 6″ N. of trough, 100′ 6″ W. of W. line of Orient St. [trough.
James,	14′ out from centre of trough, ½ rod stop. 11′ 9″ out from centre of
Lincoln Sq.,	43′ 8″ S. of N. line of Lincoln Sq., 10′ 3″ W. of W. line of Prescott St.
Millbury,	30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
"	At Greenwood St., 26′ 4″ directly east from trough.
Pleasant,	7′ 3″ out from X on trough near the ground. [gate St.
Southbridge,	33′ 2″ from W. line of Southbridge St., 28′ S. of S. line of South-
"	At Madison St., 32′ 9″ out from trough at Madison Sq., 32′ 6″ S. of S. line of 114.
"	At Stearns Sq., 6′ 3″ out from trough, 1′ 8″ S. from trough. Drip: 4′ S. of trough, 2′ 6″ W. of E. end of trough.
Vernon Sq.,	On Vernon St., 5′ 6″ above gate-box, 6′ 9″ out in direct line from where it enters the trough. [Summer St.
Washington Sq.,	On Shrewsbury St., 36′ 6″ S. of N. line of street, 60′ E. of E. line of
Webster Sq.,	15′ 9″ W. of W. line of Webster St., 30′ 10″ N. of S. line of Cambridge St.

Expended 1903.

WATER WORKS CONSTRUCTION.

Salary of Commissioner and clerical service,	$3,102	56
Payrolls, laborers,	13,849	89
Casting, patterns and fire clay,	440	01
Engineers' services and materials,	31	03
Express, freight and trucking,	750	14
Fuel,		30
Hack and horse hire,	26	25
Hardware, tools and repairs,	1	38
Hydrants, water gates, valves and repairs,	1,992	07
Inspection of pipe,	81	20
Iron pipe and freight on same,	15,168	03
Iron and steel,		94
Lead pipe and lead,	333	52
Meters and repairs,	2,482	10
Meters and repairs, Union Water Meter Co.,	2,713	00
Meters taken out,	73	74
New England Telephone and Telegraph Co., rental and service,	2	80
Paints, oils and painting,	5	64
Pipe, fittings, etc.,	1,873	75
Powder and fuse,	64	37
Printing,	11	75
Refreshments for committee and guests,	13	15
Repairs, streets,	80	76
Rubber goods,		60
Sewer pipe, cement and sand,	47	63
Special castings for iron pipe,	944	88
Telegrams and telephone tolls,		70
		$44,092 19

PIPE EXTENSION AND IMPROVEMENT ACCOUNT.

Payrolls, laborers,	$2,975	93
Carpentering and lumber,	12	00

Castings, patterns and fire clay,	683 21	
Cordage, waste and packing,	157 98	
Express, freight and trucking,	135 89	
Hydrants, water gates, valves and repairs,	786 97	
Iron pipe, and freight on same,	12,397 50	
Lead pipe and lead,	1,392 77	
Miscellaneous supplies,	1 15	
Refreshments for laborers,	19 30	
Repairs, sewers,	191 34	
Repairs, streets,	304 24	
Sewer pipe, cement and sand,	9 05	
Testing pipe,	109 60	
		19,176 93

HOLDEN SUPPLY.

Carpentering and lumber,	$6 50	
Engineers' services and materials,	5 85	
Express, freight and trucking,	3 56	
O. B. Hadwen, land,	963 32	
Services, referees, Hadwen case,	30 00	
Town of Holden, repairs, highway,	250 00	
		1,259 23

KETTLE BROOK SUPPLY.

Payrolls, laborers,	$57,074 72	
Blank books, stationery and stamps,	24 82	
Boilers, engines and repairs,	588 88	
Brick, and freight on same,	19 77	
Car tickets and transportation of laborers,	26 25	
Carpentering and lumber,	1,322 64	
Castings, patterns and fire clay,	151 22	
Cordage, waste and packing,	105 23	
Engineers' services and materials,	3,916 91	
Express, freight and trucking,	1,633 88	
Extra labor, sundry persons,	44	
Extra service, expert engineers,	818 45	
Fuel,	1,322 80	

Furniture and fixtures,	3 25
Gravel cars,	2,045 71
Hack and horse hire,	30 25
Hardware, tools and repairs,	689 21
Hose and couplings,	100 00
Hydrants, water gates, valves and repairs,	584 20
Iron pipe, and freight on same,	33 59
Iron and steel,	239 82
Lead,	12 10
Legal expenses,	38 26
Machinery, belting and repairs,	56 17
Miscellaneous supplies,	53 84
Paints, oils and painting,	174 14
Pipe, fittings, etc.,	206 55
Powder and fuse,	472 46
Printing and photographing,	6 78
Railway supplies,	347 99
Recording deeds,	4 65
Rent of land and buildings,	10 50
Rent of machinery,	305 00
Rubber goods,	381 53
Seeds, plants, trees, etc.,	9 94
Sewer pipe, cement and sand,	8,933 19
Stone posts, wall stone and labor,	393 50
Team work,	11,220 45
Telegrams and telephone tolls,	8 77
Traveling expenses,	49 43
Washburn & Moen Mfg. Co., damage by taking Kettle Brook,	50,000 00
Rent of barn,	104 00
Town of Leicester, land,	545 40
Reporting Lakeside case,	266 08
N. M. Southwick et ali., heirs of Thos. Southwick, land,	277 11
Repairs, engine and gravel cars,	590 86
A. B. Wallace and Jas. A. Swan, executors, release of claim, account pipe line Parsons' Reservoir to Lynde Brook,	50 00

Carts, wagons and repairs,	10	85
Stone crusher,	290	75
E. C. Bumpus, William Whiting, George E. Evans, services commissioners, Lakeside case,	1,000	00
Locomotive,	5,302	83
Paving blocks,	237	15
Est. of George W. Curtin, injury to person,	112	00
Medical attendance on horses,	3	00
H. B. Watts, rent of land,	200	00
Recutting paving blocks,	256	73
Appraisal of damages,	15	00
		$152,679 05

Value of stock and tools on hand, November 30, 1903, $139,966.12. Bills have been rendered to the City Treasurer to the number of 1,631, amounting to $31,624.34.

Number of abatements, thirty-seven, amounting to $617.52.

Amount of bills in hands of Treasurer November 30, 1903, $3,351.06.

Amount collected during the year, $30,653.19.

Respectfully submitted,

JOHN G. BRADY,
Water Commissioner.

December 14th, 1903.

REPORT OF WATER REGISTRAR.

To the Honorable City Council of the City of Worcester.

Gentlemen: In compliance with Section 7, Chapter 48 of the City Ordinances, the report of the income division of the Water Department for the year ending November 30, 1903, is presented.

Two hundred and ninety-eight (298) applications for water were received during the year, and placed in the hands of the Water Commissioner.

The following bills were given the Treasurer for collection:

For metered water,	25,829	bills, amounting to	$267,840 84
For annual rates,	599	bills, amounting to	7,673 87
Total bills,	26,428	Total amount,	$275,514 71

Total amount of revenue received during the year ending November 30, 1903, $270,651.66. Of this amount $1,920.76 was from uncollected bills in the hands of the Treasurer November 30, 1902.

The amount of uncollected bills in the hands of the Treasurer November 30, 1903, was $5,576.72.

During the year the sum of $1,334.94 has been abated owing to changes from annual rates to metered rates, vacant tenements, and adjustment of bills of water takers. $1,774.03 was transferred.

Fifty-seven services were shut off for non-payment of bills, and, with one exception, these bills were paid and water turned on.

The quantity of metered water furnished during the year ending November 30, 1903, was as follows:

Domestic purposes,	628,566,557 gallons.
Manufacturing purposes,	376,304,677 gallons.
Steam and electric railways,	169,804,395 gallons.
Elevators,	209,702,822 gallons.
Motors,	4,935,569 gallons.

Schools,	24,767,594	gallons.
Churches,	3,194,013	gallons.
Hotels,	13,304,144	gallons.
Hospitals,	61,857,515	gallons.
Stables,	6,680,242	gallons.
Laundries,	19,457,105	gallons.
Fire Department houses,	3,495,004	gallons.
Sewage purification works,	2,870,100	gallons.
Stores, offices, saloons, shops, etc.,	95,787,902	gallons.
Total metered water	1,620,727,639	gallons.
Unmetered water (estimated),	27,000,000	gallons.
Street sprinkling,	96,521,000	gallons.
Merrifield estate,	4,505,000	gallons.
Total,	1,748,753,639	gallons.

From the two latter amounts, street sprinkling and Merrifield estate, no revenue is received.

The number of new meters set during the year was 334, making the total number now in use 13,386.

Kinds.	Sizes.										
	⅝″	¾″	1″	1½″	2″	3″	4″	6″	8″	10″	Total.
B. and F. Piston,	608	53			5						666
Columbia	1										1
Crown	11	2									13
Desper	326	10		...							336
Duplex	1										1
Empire	1		...								1
Gem	1		1	...	1	4	9	2		2	20
Hersey	736	43	2	1	2	...	1				785
Hersey disc....	809		...				...				809
Lambert	19										19
Nash.	88			...							88
Shedd.....	1		...	...				...		...	1
Torrent			1			1	1	1			4
Trident	183	1									184
Union Rotary..	9,297	438	216	175	205	99	21	6	1		10,458
Total.....	12,082	547	220	176	213	104	32	9	1	2	13,386

During the year 1 Crown, 1 Gem, 104 Hersey, 124 Hersey disc, 2 Lambert, 18 Nash, 1903 Rotary, 2 Torrent and 25 Trident meters have been taken off for repairs. Most of them have been repaired at the department shop without cost to the owner. Total cost of repairs, $5,838.89.

Thirteen new elevators have been put in during the past year, making the total 387.

DWELLINGS, PERSONS, FIXTURES, ETC., ASSESSED FOR WATER IN THE CITY OF WORCESTER.

Dwellings,	12,191	Baths,	17,961
Families,	26,318	Water-closets,	33,454
Stores,	1,414	Hose,	8,652
Offices,	1,206	Boilers,	2,964
Saloons,	112	Horses,	5,121
Markets,	81	Cows or oxen,	803
Shops,	584	Elevators,	387
Stables,	2,069	Barber shops,	124
Persons using,	122,286	Hotels,	31
Sinks,	32,789	Schools,	74
Basins,	19,689	Motors,	42

RECEIVED.

For assessments for water, 1902,	$1,920 76	
For assessments for water, 1903,	268,730 90	
Accrued interest,	2,243 89	
Hay and grass,	169 16	
Wood,	749 19	
Wages uncalled for,	46	
Coal,	85 70	
Horse,	100 00	
Apples,	53 94	
Refuse materials,	12 00	
		$274,066 00

EXPENDED.

Amount transferred to interest on water loan,	$148,975 00

Amount transferred to sinking fund, per order City Council,	5,250 00	
Running expenses,	67,377 76	
		221,562 76
Balance transferred to sinking fund (water bonds),		$52,203 24

DETAILED ACCOUNT OF EXPENDITURES.

George W. Batchelder, salary,	$1,600 00
Clerical service,	1,742 31
Service of canvassers,	338 25
Service of meter readers,	5,232 00
Care of reservoirs,	2,064 00
Payrolls, laborers,	29,017 62
Abatement of water rates,	150 94
Advertising,	9 00
Appraisal of damages,	23 00
Blacksmithing and blacksmiths' supplies,	381 17
Blank books, stationery and stamps,	538 66
Blankets, harness and repairs,	281 03
Books and subscriptions,	3 00
Car tickets and transportation of laborers,	378 75
Carpentering and lumber,	289 04
Carts, wagons and repairs,	236 00
Castings, patterns and fire clay,	3,747 16
Chemical analyses (water samples),	237 00
Cordage, waste and packing,	87 60
Damage by bursting pipe,	278 00
Engineers' services and materials,	505 88
Express, freight and trucking,	642 03
Extra labor (sundry persons),	242 00
Fuel,	159 07
Furniture, fixtures and repairs,	6 70
Gas,	221 40
Hack and horse hire,	214 13
Hardware, tools and repairs,	608 31
Hay, grain and straw,	1,724 75

Horses,	490 00
Hose and couplings,	180 08
Hydrants, water gates, valves and repairs,	485 39
Ice,	39 73
Insurance,	24 75
Iron and steel,	188 80
Loam, fertilizer and seeds,	31 49
Medical attendance on horses,	50 00
Meters and repairs,	298 83
Meters and repairs (Union Water Meter Co.),	2,504 78
Miscellaneous supplies,	57 68
New England Telephone & Telegraph Co., rental and service,	62 49
Paints, oils and painting,	479 29
Pipe, fittings, etc.,	334 76
Printing and photographs,	222 64
Refreshments for committee and guests,	99 30
Rent of land for watering trough (B. & A. R. R. Co.),	1 00
Rent of land, Woodward Street, M. J. Whittall,	300 00
Repair of buildings,	2 50
Repair of sewers,	48 45
Repairs at shop,	35 50
Repair of streets,	65 40
Rubber goods,	15 44
Sewer pipe, cement and sand,	911 58
Special castings for iron pipe,	403 65
Stone posts, wall stone, and labor,	38 00
Taxes in Holden,	194 76
Taxes in Leicester,	452 30
Taxes in Paxton,	133 81
Team work,	611 26
Travelling expenses,	3 52
Watering streets,	6 36
Building telephone line,	61 90
Building road,	14 93

Division wall at Kent's,	430 67	
Peter Brook filter beds,	682 77	
Repairs on spillway at Kettle Brook,	690 27	
Repairs on distributing basin, Holden Reservoir,	1,334 80	
Rice, Barton & Fales Machine & Iron Co. (damage to property by bursting of water pipe),	3,825 00	
Amount refunded for wood,	10 00	
Repairs on Lakeside bridge,	28 77	
Wire fencing,	132 45	
Services of expert engineers,	135 00	
Building manholes,	258 86	
		$67,337 76

Revenue.

The total amount of collection for water rates during the financial year ending November 30, 1903, was $270,651.66, the largest in the history of the department.

Canvass.

The canvass of the water takers shows a gratifying increase, and our figures this year show that 122,286 persons are using city water. We estimate the population to be 127,286.

Inspection.

During the past year a systematic inspection of water fixtures has been put in operation. When a meter reading shows an unusual consumption of water, an inspector from this department is sent to the premises with orders to read the meter and examine the water fixtures to see if any leakage exists. In many cases we have discovered leaks which, if allowed to run, would have caused a heavy bill for the owner to pay. Prompt notice is given if any leakage is discovered, and usually the owner makes the necessary repairs at once. This system tends to reduce the revenue somewhat, but we

do not think the department should flourish by the wasting of water through defective fixtures. Our aim is at all times to prevent waste; and, with our limited water supply, it is especially necessary that none be wasted. It is evident that our system of inspection has met public approval, for, while we formerly had large numbers of consumers who called to discuss the amounts of their water bills, we very seldom have any who call for that purpose now.

METERS.

Our meter system has given such excellent satisfaction that in nearly all places where meters can be set and properly cared for, the owners have ordered them installed. We have now in use 13,386 meters, which makes Worcester one of the most extensively metered cities in the country. Your Water Registrar wishes the system could be made to cover every service or fire pipe in the city. It is the practice of the department to run so-called fire pipes into buildings for the purpose of fire protection only. After these pipes have been put in there is no means of knowing how much water may be drawn through them, and it does not seem businesslike to permit this to continue. I would, therefore, respectfully suggest that the honorable City Council consider the advisability of adopting an ordinance requiring a meter to be set, at the owner's expense, on every fire pipe in Worcester running into private property.

SUPPLY.

Though the question of water supply is not one coming directly under the supervision of the Water Registrar, nevertheless, it is one in which he is deeply interested and one which has been the source of some anxiety in the past few years. It is my opinion that steps should be immediately taken to increase the supply. The city is growing rapidly, the consumption of water, as in all large cities, increases more rapidly than the population, and there is no water available which can be procured at short notice. It was only last June, after a dry period of four or five weeks, that a shortage of water

appeared imminent, and, in the judgment of the City Engineer and Water Department officials, it was necessary to issue notices restricting the use of water. The rains came and saved us at that time, but there have been times when dry periods have lasted for months, and if one of them should come now it would mean serious difficulty. It is my opinion, therefore, that steps should be taken toward diverting water from Asnebumskit, in accordance with the plans of the City Engineer.

Respectfully submitted,

GEORGE W. BATCHELDER,
Water Registrar.



GATE HOUSE, RESERVOIR No. 2.
KETTLE BROOK.

REPORT OF CITY ENGINEER.

CITY ENGINEER'S OFFICE, Dec. 11, 1903.

To the Honorable City Council of the City of Worcester.

Gentlemen: I have the honor to submit the following report for the Engineering Department for the year ending November 30, 1903, as follows:

STREETS.

Preparatory to action by the City Council, decrees have been prepared for the laying out and making public of 13 streets, with a total length of 4.51 miles, a list of which is exhibited in the following table:

STREETS LOCATED FROM DECEMBER 1, 1902, TO DECEMBER 1, 1903.

Street.	From	To	Width, Feet.	Length, Feet.	Date of Decree.	Remarks
Belmont	Shrewsbury	Lake Ave.	100	3144.45	Sept. 28, '03	Reloc.
Bigelow Ct.	Mechanic	Front		292.23	Jan. 2, '03	
Bradford	May	Parker	40	643.07	Dec. 29, '03	
Claremont Sq.	Oberlin	Claremont	40	281.48	Sept. 28, '03	
Grand View Av.	Main	Stafford	40	1924.74	Dec. 29, '03	
Grove	Forest	Holden	49.5	1704.00	May 5, '03	Reloc.
James	Stafford	So. Ludlow	60	1300.00	May 5, '03	"
Oberlin	Main	Woodland	50 45	622.26	Sept. 28, '03	
Shrewsbury	E. Worcester	Belmont	100	6865.00	Sept. 28, '03	Reloc.
So. Ludlow	James	City line	60	1559.70	May 5, '03	"
Stafford	Main	James	65	4830.43	May 5, '03	"
Jacques	Webster		35	545.10		
Burncoat				131.50		Reloc.
Total length,				23,843.96		

Construction stakes were set on the following named streets:

Street	From	To	Length in Feet	Remarks
Albert	Grand		277.0	
Blithewood Ave.	Millbury Ave.		2,178.9	
Bloomingdale Rd.	Putnam Lane	Plantation	1,497.9	
Channing	Hermitage Lane	Green Lane	1,079.9	
Coes	Coes	Mill	799.4	Relocation
Esther	Vernon	Upsala	1,365.9	
Everard	Belmont	Vinson	1,021.8	
Greenwood	Upland		600.0	
Grove	W. Boylston	Holden	4,157.2	Macadam
Kingsbury	Hollywood	Page	310.0	
Main	Richards	Stafford	3,715.0	Bitulithic paving.
Main	Ludlow	City Line	1,834.0	Macadam
Main	School	Lincoln Sq.	823.0	Block paving
Millbrook	Millbrook	Northwesterly	540.0	
W. Boylston	Grove	Barber's Crossing	5,745.0	Macadam
Lakeside Ave.	Lovell		1,000.0	Macadam (Private Street)
Total length			26,945.0	

The street work for general purposes is as follows:

	No. or Length in Feet.
Curb stakes set on 25 streets,	16,623
Cross-sections for estimates, three streets,	10,382
Street bounds set,	144
Street bounds readjusted,	355
Line and grade given on application,	202
Locations examined and approved for electric light conduits,	7
Locations examined and approved for electric light poles,	182
Locations examined and approved for gas mains,	54
Locations examined and approved for telephone conduits,	24
Locations examined and approved for telephone poles,	14

Decrees were prepared for the re-establishment of grades by the City Council on the following streets:

Street.	Length in Feet.	Remarks.
Blithewood Avenue	800	
May	1,000	Relocation

For renumbering the following named streets by the City Council surveys and plans were made and notices sent to the owners and occupants, in accordance with the orders therefor:

Street	From	To	Length in Feet.
Chrome	Wall	Plantation	1,045
Elm	Merrick	Park Avenue	1,054
Endicott	Vernon	Quinsigamond Avenue	2,692
Harlow	Lincoln	Crescent	1,200
Louise	Vernon	Upsala	902
Lyman	Webster		1,556
Oberlin	Main	Florence	1,470.3
Stafford	Main	City line	7,616.5
Woodward	Cambridge		805
Total length			18,340.8

Grades were established by the City Council upon 2.78 miles of private streets, the decrees for which were prepared and recorded for the ways named below:

Street	From	To	Length in Feet.
Ash Avenue	Grafton	Houghton	1,032.5
Ashwood	Ash Avenue	(South)	508.5
Bradley Avenue	Brooks	Fales	1,287.0
Brookland	Union Avenue	Ash Avenue	490.8
Carleton	Heard	Pine View Avenue	527.0
Drury Lane	Park Avenue	Massachusetts Avenue	504.0
Hadwen	Heard	Pine View Avenue	611.0
Harvey	Hamilton		478.0
Loxwood	Granite		2,707.0
Marion	Shannon		242.2
Mower Avenue	Main	Beacon	381.4
Nelson	Carleton		131.5
North Terrace	Shannon		278.1
Norwood Avenue	Hamilton		598.0
Pine View Avenue	Hamburg		1,000.0
Shannon	Union Avenue		647.0
Thistle Avenue	Hamilton		368.0
Thompson	"		335.0
Vivian	Heard	Pine View Avenue	567.0
Waterman	"	" " "	603.0
Wexford Road	Union Avenue		648.5
Henderson Avenue	Main		753.0
Total length			14,698.5

Seventy-three plans for street purposes have been made and filed, and duplicates furnished for recording purposes. Measurements and schedules of work performed by the Street Department have been supplied in the usual forms.

SEWERS.

In sewer construction the season has added 6.41 miles to the aggregate, for which the department has furnished plans, gradients and other assistance of an engineering nature.

The Main Street sewer in the Valley Falls district, which has been under consideration for many years, is finally completed to the city line. The Maywood Street and Englewood Avenue surface drain has advanced to a point that can soon give relief to a locality that has suffered great inconvenience from improper drainage.

The new concrete invert to the Mill Brook arch has made commendable progress, and has added much to its strength and security as well as to the sanitary condition of this important structure.

Substantial addition has been made to the filtration areas at the sewage disposal works, to which about twelve acres of filter area have been very nearly completed, and for which plans were provided by this department.

The Middle River improvements have been extended from Holmes Street to the dam of the central works of the American Steel & Wire Company, upon the westerly side of the stream, and have added very materially to the appearance and sanitary condition of the locality. At Holmes Street the vertical masonry walls of the former construction were discontinued, and an earthen dyke built as a more economical and satisfactory method for retaining the made land to be deposited in the rear from the proposed excavations in the pond. The face of the dyke is paved and grouted with cement to prevent its disturbance from ice or other causes. The work has been very satisfactorily accomplished by the Sewer Department, and gives a good illustration of what may profitably be extended in reclaiming and making useful a hitherto objectionable source of much complaint.

The sewage disposal plant of Lake View has progressed to a point that warrants its expected use in the near future. The peculiar location of this suburb makes the disposal of its sewage somewhat out of the ordinary, and, for economic reasons, it was thought best, for a few years at least, that the sewage should be pumped over the divide for treatment at

the sewage disposal works. The situation is further complicated by the large additions to the local population during the summer months, amounting on certain days to twenty thousand or more people, and for which provision should be made. Areas of considerable size to which the residential section of the city has already extended, and lying in close proximity to the summit, operated against the method of direct pumping. To avoid the necessity of a considerable volume of sewage descending to the lake level and being pumped back again, the Shone system of sewerage was recommended, and approved by the City Council. The drainage area provided for is divided into three districts, and the ejector stations are located at convenient points for intercepting the sewage from each. The stations are provided with a receiving chamber, into which the force main from the next lower station discharges, and which also receives and furnishes a temporary storage for the sewage from its adjacent district.

The ejectors to be first installed comprise one ejector at the first station with a capacity of 150 gallons per minute, and two ejectors of 100 gallons capacity at each of the two other stations, all of which will be operated by compressed air, supplied from the power station erected on the lake shore. The compressing plant consists of 8x10 Ingersoll-Sargent belted compressors, driven by 15 h. p. electric motors, each in duplicate. The height the sewage is raised from each ejector station is respectively 55-70-65 feet. The plant is in many respects similar to the one in operation at the Worcester Highlands district, and which is giving satisfaction.

The usual inspection and gradients have been provided for house drains, of which there were 459 in number.

The number of plans made for the constructions and special use of the Sewer Department during the year amounted to 69.

WATER.

Kettle Brook Reservoir No. 2 has been completed and put to use. Work upon this structure was begun in the latter part of last year, when the draft pipe and valves were set before cold weather put a stop to further construction. The

dam and reservoir is upon the site of the old Mann Pond, and is intended as a final storage in the development of the Kettle Brook system of reservoirs. The dam is an earthen structure, with a Portland cement concrete core wall, and is similar in construction to the dam built last year at a point higher up the stream. No special difficulties were encountered in its construction, as a very good foundation was found at a moderate depth below the surface. Along most of its length a dense ledge of rock was uncovered, into which the core wall was founded, and for the remaining distance hard pan existed. Immediately below the dam a pit of very good water excluding material was found, which was used for the entire upper half of the dam, and also in other places where special care was required. All the stone for masonry and concrete work was quarried on land owned by the city. The most troublesome feature in connection with this reservoir was the removal of the mud, the accumulations of many years, covering the floor of the basin. A locomotive with cars was used in the excavations, and the latter part of the season an additional train was added. Twenty-three thousand eight hundred and ten carloads of mud were removed, together with such other material as analysis showed was necessary. The same buildings that were erected last year for the accommodation of the men were again used, and the stone crushing plants installed at the same time required no alteration.

A small concrete dam was also built on Peter Brook, to allow a diversion of the water from its natural channel into Kettle Brook with convenience. The city acquired the rights of this stream some years ago, but hitherto no adequate means of control has existed.

The Paxton dam, now designated Kettle Brook Reservoir No. 4, has been the subject of much interest during the season. The dam is an antiquated structure of a very flimsy nature, built many years ago for manufacturing uses, and has been a source of concern ever since it came into possession of the city. At various times it has shown signs of weakness, and in the month of September unmistakable evidence was discovered that its use for impounding purposes could not be safely prolonged without reinforcement. Notice of its condi-

tion was given to the City Council, with the request that authority be granted to breach the dam, that the reservoir might not again be filled in its present condition. With the approval of the City Council measures were at once taken to carry out the work, and men with the necessary tools were dispatched from the scene of operation at Manville. The breach was begun at a width of 60 feet, in order to allow sufficient space for the purpose when the excavations should have reached the required depth. As the level of the water was approached, a strong bulkhead of timber, with a sluice gate, was built some twenty feet below the water's edge, and secured in such manner as to allow about three feet of the surface of the reservoir to be drawn off at a time. Through the entire dam below the bulkhead, and for a short distance above, a trench of the desired capacity was excavated and lined with heavy sail cloth securely fastened to the bulkhead, and anchored with sand bags throughout its length. The remaining earth between the trench and the basin was then removed, allowing the water to flow to the bulkhead and thence through the sluice gate as desired. The sail cloth proved a perfect conveyor, and permitted large volumes of water to pass through without wash. When the water in the reservoir was drained the depth of the trench, the bulkhead was again lowered, and the operation repeated until the bottom was reached. The original waste pipe being but twelve inches in diameter, is absolutely worthless as a means of control, and in anticipation of a reconstruction of the dam in the near future, a new and larger waste-pipe has been laid in the excavations made for draining the reservoir. This being the most important storage basin on the Kettle Brook system, I deem it of great importance that the dam should be strengthened and put to use at the earliest possible date. Whenever the reconstruction of this work is undertaken, certain portions of the basin should also receive attention and be made clean and suitable for the purpose. With the exception of this dam and basin on Kettle Brook, the several reservoirs are in good condition.

The following table shows the monthly and annual, and the average daily and monthly consumption of water, in gallons, for the fiscal year:

Months.	Consumption per Month.	Average Monthly Consumption.	Average Daily Consumption per Month.	Average Daily Consumption for the Year.
December	276,213,960		8,910,128	
January	276,363,560		8,914,954	
February	245,747,920		8,776,711	
March	280,320,480		9,042,596	
April	289,805,120		9,660,171	
May	317,727,960		10,249,289	
June	292,871,920		9,762,397	
July	323,076,160		10,421,812	
August	307,031,560		9,904,244	
September	320,136,520		10,671,217	
October	313,524,200		10,113,684	
November	286,850,520		9,561,684	
Total		294,139,156		9,670,328

The maximum consumption of water for one day amounted to 13,052,600 gallons.

It will be observed from the above table that the consumption of water for every day in the year amounted to 9,670,328 gallons, and, as a further illustration of the uses of water and increase of its consumption, I append the following table, giving the average daily draft and number of people using city water for the past eight years as an index of what may be expected in the near future:

Year.	Average Daily Consumption.	Number of Persons Using City Water.	Average Daily Gallons per Capita.
1896,	6,125,630	100,586	60.9
1897,	6,083,916	103,702	58.6
1898,	6,795,578	105,963	64.1
1899,	7,632,428	110,773	68.9
1900,	8,152,373	113,217	72
1901,	9,013,785	116,064	77.6
1902,	8,211,878	119,331	68.8
1903,	9,670,328	122,286	79

It will be observed that the rate of increase is quite marked, and out of proportion to the increase in population. While it undoubtedly is true that the rate increases with the population in many cities, it is quite too rapid under the conditions existing here. If the policy of indiscriminate use is to be continued, the question of an additional supply is a vital one. The efforts of the Water Department in building storage res-

ervoirs to supply an adequate amount of water during times of stress, are largely nullified by a too liberal use of unmetered water. This is due in a considerable measure to the custom of extending firemains into private properties without means of measurement, and thereby offering opportunity for improper use. In connection with this I quote Hon. J. O. Hall of Quincy, Mass., who at the 1902 convention of the New England Water Works Association said, "The individual tax payer should not be compelled to bear any burden which, by any interpretation, can pass into an individual benefit to somebody else."

Since the taking of Kettle Brook in the year 1895, as an additional supply, a gradual increase in the storage of water has been made, until today the several sources are practically developed, although the dam at Paxton must be rebuilt. During this time the increase of population using city water exceeds twenty-three thousand, and every succeeding year was one of generous rainfall, considerably exceeding the average precipitation, with one exception, when steam pumps were installed at Coes Pond. Such a period is not a proper standard to use in estimating the amount of water that may be expected in one or more dry seasons, and therefore should not encourage hopes that the present supply is inexhaustible, or even adequate. If the present excessive use of water is to continue, and the natural growth and consumption be provided for, the procuring of an additional supply demands your immediate attention.

A question which has hitherto lacked the consideration that its value would seem to warrant, is the forestation of the catchment areas of the city's water supply. That forests have a considerable effect on the run-off of the streams has been noted in the action of the brooks from which the supply is obtained. The Tatnuck and Kettle Brook water sheds possess a considerable percentage of forest, while Lynde Brook shed, which lies between the other two, is practically deforested. Observation has shown that the Lynde Brook stream falls considerably below the others in its run-off, and very often fails to yield any water during the summer months, while the other two streams keep alive. That absence of forests cause floods

and periods of dryness in streams, I believe to be quite generally recognized, and also that forests serve as storage reservoirs and tend to equalize the flow. The planting of spruce, pine and other evergreen trees upon the large areas owned by the city would, in my opinion, prove profitable, and deserves affirmative action on your part.

A matter of great import to the welfare of the city's water distribution pipes and other underground metallic conduits, is the question of electrolysis. For some years this subject has received the attention of the Water Department, and numerous tests and recommendations have been made from time to time by electrical experts in the attempt to guard against the destructive agency of electric leakage or stray currents. While the city so far has escaped very serious damage, I believe the matter to be of such importance as to warrant the enactment of an ordinance defining the conditions under which electric systems shall be installed and maintained.

Miscellaneous.

The continuation of the grade crossing hearings requiring additional plans and estimates has been the occasion for extended co-operation by this department. Several plans in detail of the crossings under consideration have also been mapped for constructional purposes.

Areas of considerable extent have been surveyed and mapped for the use of the Assessors, together with the procuring of much other data of particular value to that department.

The number of separate plans for all purposes made during the year amounted to 185.

For the Public Buildings Department, batters and grades for the additions to the City Hospital were provided, also for the new school building at Holland Road.

The usual measurements and maps of the additions to the lots of Hope Cemetery have been made as requested.

To my assistants, for their faithful and efficient services, my appreciation and thanks are hereby extended.

Respectfully submitted,

FRED'K A. McCLURE,
City Engineer.

ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR AND THE CITY ENGINEER

OF THE

CITY OF WORCESTER

FOR THE

YEAR ENDING NOVEMBER 30, 1904.

Worcester, Mass.
THE HAMILTON PRESS
311 Main Street.
1904



ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR, AND THE
CITY ENGINEER

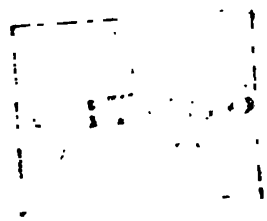
OF THE

CITY OF WORCESTER,

FOR THE

YEAR ENDING NOVEMBER 30, 1904.

Worcester, Mass.:
THE HAMILTON PRESS
311 Main Street
1905



WATER COMMITTEE.

Alderman JULIAN F. BIGELOW,
Alderman LEWIS J. TERRILL,
Alderman CARL H. BOCK,
Councilman EDWIN S. CLARK,
Councilman NORMAN B. PARSONS,
Councilman MILLARD F. KELSEY,
Councilman CHARLES A. ORSTROM.

WATER COMMISSIONER.

GEORGE W. BATCHELDER.

WATER REGISTRAR.

GEORGE C. HUNT.

REPORT OF WATER COMMISSIONER.

To the Honorable City Council of the City of Worcester.

Gentlemen: In compliance with section 4, chapter 48, of the City Ordinances, the report of the Water Commissioner for the year ending November 30, 1904, is respectfully presented.

Reservoirs.

During the past year repairs have been made on the dams and gate houses, necessary to put them in good condition.

The reservoirs, at Holden, showed a growth of vegetable matter, on their shores, which was removed by men in the employ of the department.

Large numbers of stumps were also removed from the flowage area of Holden No. 1. This work will undoubtedly result in an improved condition of the supply from that source.

The reservoirs and streams supplying them have been under careful supervision to guard the purity of the supply.

Pipe Lines.

The system of distribution has been extended 4.501 miles during the year, making a total of 189.238 miles of main pipe now in use.

Summary of Statistics.

Dates of construction: 1845, 1864, 1883, 1895, 1896, 1900, 1901, 1902, 1903, 1904.

Source of supply: Impounding reservoirs in the towns of Leicester, Paxton and Holden.

Mode of supply: Gravity.
Capacity of reservoirs, 2,549,827,789 gallons.
Average pressure: High service, 150 pounds; low service, 70 pounds.
Number of miles main pipe, 2 inches to 40 inches diameter 189.238.
Number of miles service pipe 131.816.
Number of fire hydrants 1946.
Number of water gates 2769.
Number of water meters 13,634.
Total cost of works to date, Dec. 1, 1904, $4,278,364.40.

Recommendations.

In accordance with recommendations heretofore made, the City Council passed an ordinance, this year, requiring the Water Commissioner to set meters on all fire mains. As this ordinance did not take effect until some months after the appropriation bill was passed, and no money was available, for the purpose, none of the meters have been set.

It is believed, however, that in the appropriation for 1905, an item for the purchase and setting of these meters will be allowed, and the work can be started.

Supply.

The matter of water supply is of great importance and worthy of the careful study of members of your honorable body.

In the past, it has been frequently urged, by your efficient City Engineer that the present supply, when fully developed, was inadequate for a city of this size. A careful study of the situation, and the advantage of an intimate acquaintance with the question, has convinced the writer that an additional supply is very necessary.

No water is at present available which could be procured at short notice, except that in Coes pond, which is small in

quantity and of a quality not desirable for a municipal water supply.

It seems desirable that the city should immediately take steps to commence the development of the Asnebumskit water supply, and it is therefore recommended by this office.

Electrolysis.

Examinations of the pipe system with a view of determining whether it was in any danger from electric action, have been made, by an expert, during the past year. He finds evidence that the possibility of such difficulty does exist, and it seems advisable to have an electrical engineering department established for the purpose of keeping close watch of the system, with a view of preventing trouble from this source.

This department recommends the appointment of an engineer, for this purpose.

The appreciation of this office for the co-operation and assistance of the engineering department and the assistants in this department, is hereby acknowledged.

Forty-four fire hydrants have been set during the year.

The total number now in service for fire protection is 1946. Of this number 201 are on the premises of individuals and corporations.

Number of water cart hydrants in use, 123.
Number of car sprinkling hydrants in use, 41.
Number of drinking fountains in use, 9.
Number of watering troughs in use, 18.

Elevation of Reservoirs above Main Street at City Hall.

Kettle Brook Reservoir No. 1.

Rollway 364.36 feet.

KETTLE BROOK RESERVOIR NO. 2.

Rollway 507.5 feet.

KETTLE BROOK RESERVOIR NO. 3.

Rollway 559.00 feet.

KETTLE BROOK RESERVOIR NO. 4.

Rollway 601.74 feet.

LYNDE BROOK RESERVOIR.

Rollway 341.94 feet.

PARSONS' RESERVOIR.

Rollway 237.80 feet.

HOLDEN STORAGE RESERVOIR NO. 1.

Rollway 269.88 feet.

HOLDEN RESERVOIR NO. 2.

Rollway 237.80 feet.

HOLDEN DISTRIBUTING RESERVOIR.

Rollway 177.00 feet.

Elevation of Main street at City Hall above tide water, 481 feet.
Water pressure at City Hall, low service, 70 pounds.
Water pressure at City Hall, high service, 150 pounds.

In addition to the service pipes, which are reported in tabulated form, there have been fifty-six (56) changed, for which

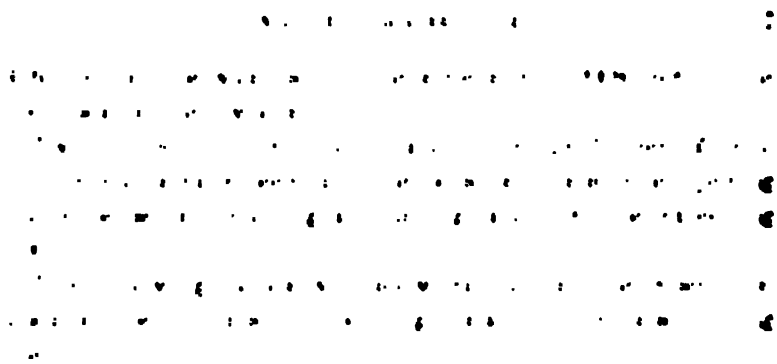
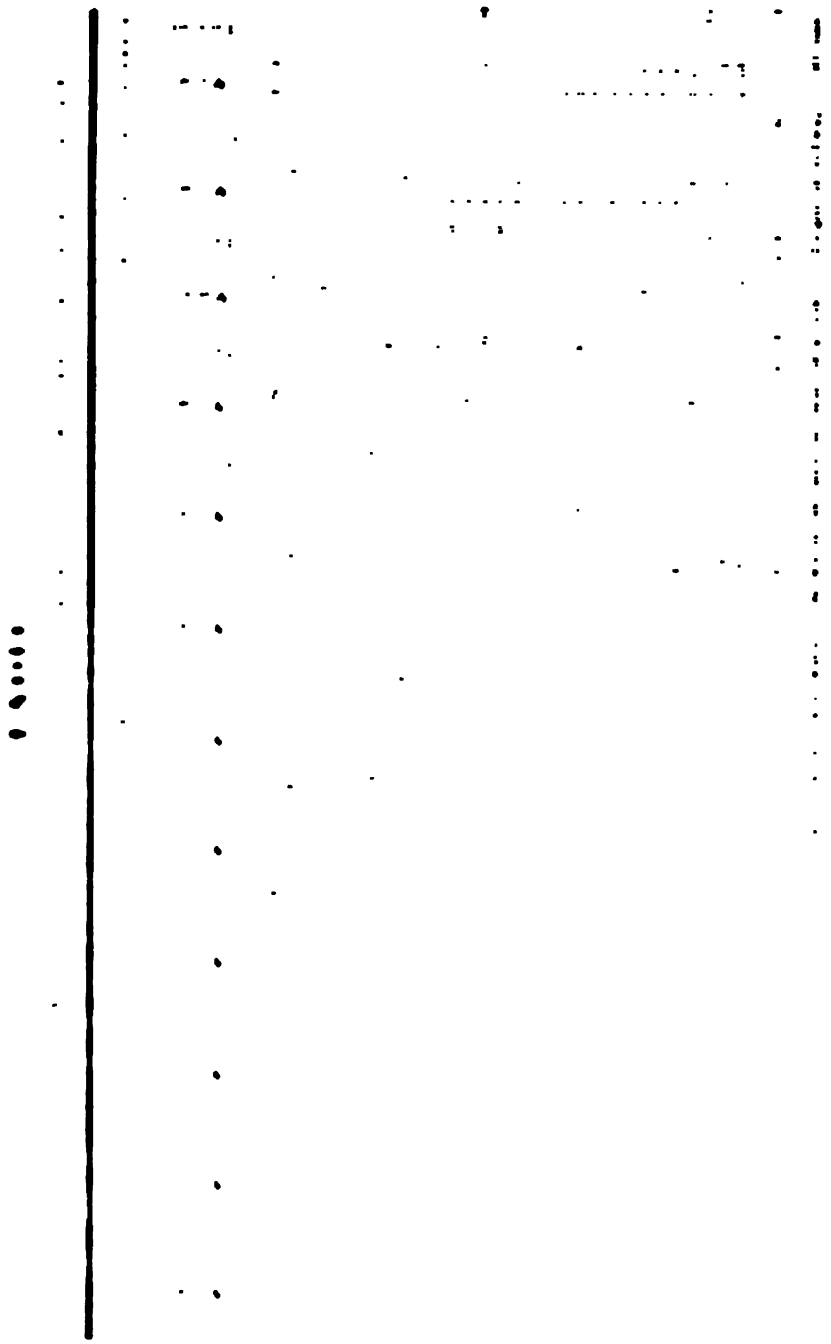


TABLE.

SHOWING THE DAILY HEIGHT OF WATER IN HOLDEN RESERVOIR AND THE RAINFALL FOR THE YEAR ENDING NOVEMBER 30, 1904.

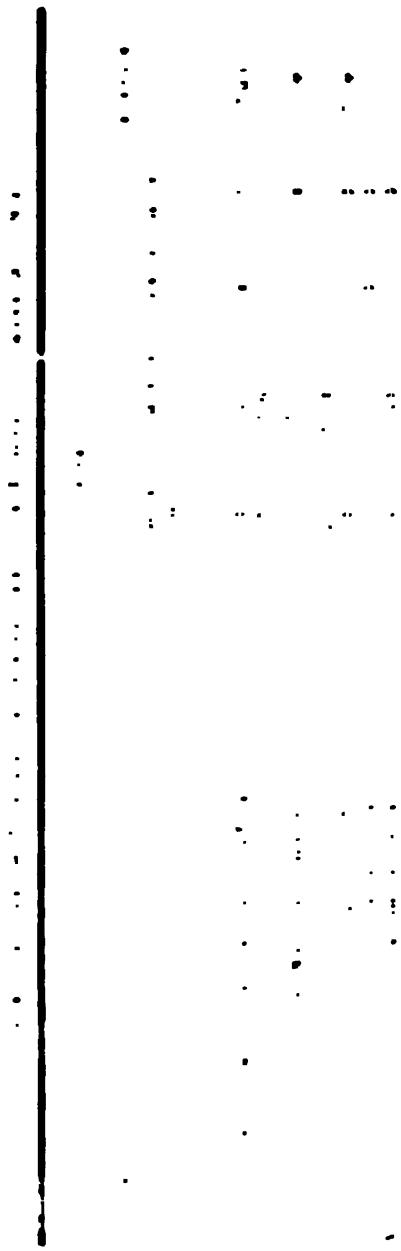
Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water	Rainfall.	Water.	Rainfall.
1	28.28		29.23		25.28		25.25	.81	30.27	1.32	31.22	.02	31.45		30.47	1.05	28.93	.09	27.13	.06	24.83		21.56	
2	28.21		29.20	.32	25.13		25.26	.63	30.39		31.30		31.43	.20	30.56	.11	28.90	.56	26.98		24.73		21.57	
3	28.20	.68	29.20	.48	24.93		25.27	.09	30.25		31.32		31.45	.40	30.53		28.85	.09	26.91		24.66		21.58	
4	28.15		29.17		24.75		25.69		30.12		31.30		31.45		30.36		28.78		26.78	.02	24.63		21.58	
5	28.08		29.13		24.60		26.03		30.17		31.32		31.45	.26	30.38	.82	28.68		26.73		24.33		21.58	
6	28.04		29.11		24.43	.29	26.13		30.18		31.30		31.47	.05	30.53	.02	28.60		26.68		24.03	.30	21.59	
7	28.03		29.07		24.22		26.22	.53	30.16	.23	31.36		31.54	.73	30.50	.02	28.51		26.56		23.58		21.59	
8	27.99		29.01		24.10		27.18	.59	30.21		31.43		31.60	.04	30.39		28.48	.35	26.43		23.10		21.59	
9	27.93		28.98	.46	24.18		28.54		30.28	.20	31.44	.67	31.59	.13	30.37		28.42		26.30	.39	22.91		21.60	
10	27.95	.66	28.95		24.19		29.02		30.58	1.17	31.58	.15	31.58		30.28		28.38	.39	26.23	.01	22.75	.05	21.59	
11	27.97		28.94		24.16		29.23		30.37		31.61	.22	31.57		30.25		28.33	.23	26.13		22.63	.07	21.60	
12	27.95		28.71		24.10		29.41		30.26	.28	31.61		31.55		30.16		28.28		26.03	.31	22.59	.24	21.58	
13	28.18	.83	28.45	.41	24.07		29.52		30.17		31.59		31.48		30.08	.10	28.21		25.93		22.48	.17	21.58	.38
14	28.37		28.27	.36	24.04		29.61		30.25	.01	31.57		31.42		30.04		28.13	.16	25.78		22.37			.87
15	28.42		28.02		24.01	.30	29.69	.10	30.25		31.51	.07	31.36		29.98		28.09			3.22	22.33		21.65	
16	28.42		27.79	.16	23.94		29.64		30.21	.43	31.56	.09	31.34		29.93		27.99	.04	26.34		22.23		21.64	
17	28.38		27.54		23.88		29.49		30.18		31.49	.06	31.30		29.87		27.95		26.28		22.08		21.66	
18	28.32		27.25		23.81		29.36	.40	30.26		31.52	.02	31.27		29.72	.20	27.91		26.16		21.97		21.61	
19	28.28		26.96		23.75	.12	29.22		30.26		31.57	.40	31.21		29.66		27.80		26.11		21.83		21.61	
20	28.25	.77	26.71	.07	23.68	.19	29.11	.12	30.43		31.65	.35	31.11		29.60		27.73	2.00	25.93		21.71		21.61	
21	28.95	.64	26.44		23.63		29.10		30.51	.03	31.57		31.04	.04	29.50		28.03	.15			21.63	1.12	21.61	
22	29.06	.14	26.17	.76	23.76	1.16	29.05	.07	30.14		31.60		31.06		29.48		27.86		25.65		21.77	.07	21.81	
23	29.10		25.96	.42	24.46		29.04	.01	30.15		31.59		31.95		29.38	.43	28.03		25.51		21.88		21.81	
24	29.13		26.04		24.88	.39	29.33		30.13		31.55	.08	30.86		29.36	.23	27.73		25.36		21.78		21.81	
25	29.16		26.17		25.02		29.58	.06	30.15	.11	31.48		30.76	1.11	29.38	.12	27.66		25.33	.15	21.56		21.97	
26	29.21	.22	26.21		25.09		30.12		29.86		31.46	.07	30.83		29.28	.06	27.58		25.21	.08	21.51	.11	21.73	
27	29.26	.06	26.18	.73	25.09		30.43		29.88	.93	31.51	.15	30.73		29.17		27.47		25.10		21.53		21.55	.04
28	29.28		26.00		25.08	.23	30.36		30.73	1.97	31.50		30.64		29.08	.04	27.41		24.98	.02	21.52		21.40	
29	29.28	.13	25.80	.05	25.18		30.30		31.60	.62	31.49		30.53	.42	29.16	.80	27.36		24.86	.52	21.52		21.26	
30	29.27		25.63	.16			30.28		31.65	.05	31.48	.07	30.50	.22	29.07		27.22		24.88	.05	21.53		21.07	.25
31	29.25		25.45				30.30				31.47	.10			28.98		27.15				21.56			
Totals.		4.13		4.38		2.68		3.41		7.35		2.52		3.60		4.00		4.06		4.83		2.13		1.54

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 30.10 feet.
Rainfall for year ending November 30, 1904, 44.63 inches.



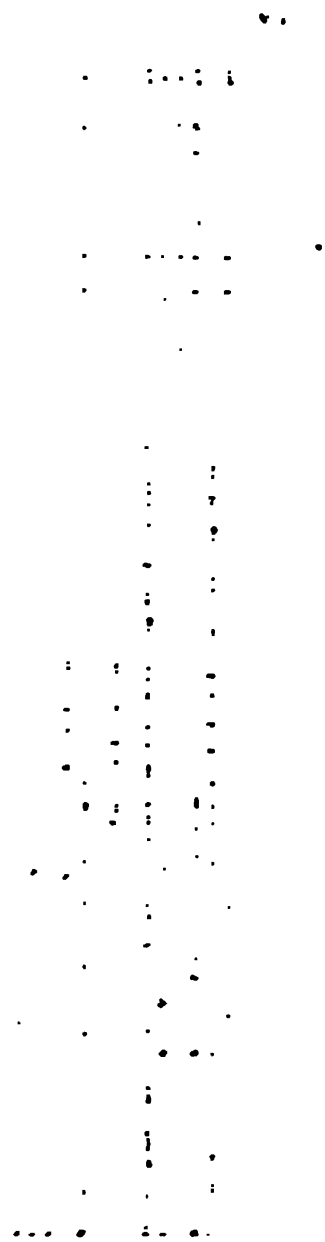
LENGTH AND SIZE OF NEW PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1904.

STREET	LOCATION	PIPE		HYDRANTS	GATES	SERVICE
		Size in Inches	Length in Feet			
Apricot	From Wildwood avenue to Main street	12	421		1	High
Arbor Vitae	" Main street, northerly	8	439	1		Low
Ashley	" Summit avenue to Francis street	8	271		1	High
Blaine avenue	" Main street, southerly	8	421	1		Low
Bradley avenue	" Brooks avenue, northerly	8	108		1	High
Chrome	" Orient street, easterly	8	248	1	1	"
Church place	" Pleasant street, southwesterly	8	196		2	"
Farley avenue	" Burncoat street, westerly	12	759	1	1	"
Forest	" end of pipe northerly	16	1,340	2	4	"
Francis	" Ashley street, northerly	12	556	1	1	"
Franconia	" June street, northwesterly	6	152		2	Low
Franklin	" Trumbull to Vine street	12	458	1	1	High
Gates Lane	" Main street, westerly	16	814	2	1	Low
Grafton	" Union square, southeasterly	16	90		1	High
Greenwood	" end of pipe southerly	12	1,695			
		10	314	2	2	"
Hadwen road	" June street, westerly	6	441	1	2	Low
Hamilton	" Warner avenue east to Hamilton street	2	1,850			High
Harlem	" Vernon street, westerly	8	202			"
Jacques	" end of pipe easterly	6	145	1		Low
		4	104			High
May	" Park avenue to Lovell street	16	1,873	2	4	
		18	254			"
Norfolk	" Bloomingdale road, westerly	6	533	1	1	Low
North terrace	" Shannon street, westerly	8	294	1	1	High
Plantation	" Belmont st. to Notre Dame Normal Ins.	10	3,940			
		12	1,800	3	7	"
Pleasant	" Moore avenue, westerly	12	1,977	2	2	"
Summit avenue	" Burncoat to Ashley street	12	345	1		"
Vine	" Franklin street, northerly	12	186		2	"
Wilson	" Seward street, easterly	8	818	2	3	Low
Wye	" Bloomingdale road, southerly	8	307		1	"
			23,351	26	42	



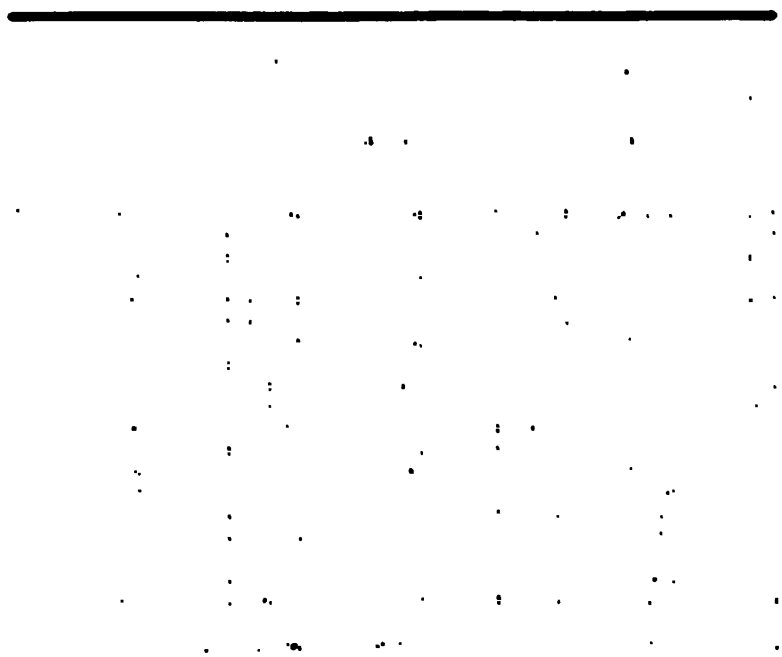
Location, Size and Kind of Hydrants Located During the Year Ending November 30, 1904.

Street	Location.	Kind.	Size.	Size of Connections.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Arbor Vitae,	At north end of street opposite house No. 11	Florence.	6	6	2½	2	8	32	Low
Blaine avenue,	On north line of lot No. 11	"	6	6	2½	2	8	26	Low
Bloomingdale road,	82′ east of east line of Grafton street	"	8	8	2½	4	16	140	High
" "	43′ west of west end of Boston & Albany brick freight house	"	8	8	2½	2	16	140	High
" "	12′ east of west line of No. 32	"	8	8	2½	2	16	138	High
" "	114′ west of west line of wooden tannery building, on south side of street,	"	8	8	2½	2	16	135	High
Chrome,	On east line of lot No. 21	"	6	6	2½	2	8	100	High
Farley avenue,	71′ east of east line of Hunt's house No. 52	"	8	8	2½	2	12	47	High
Forest,	14′ 6′ north of north line of Wheeler's barn	Chapman.	6	6	2½	2	16	85	High
"	On north line of Allen's tenement house lot	"	6	6	2½	2	16	100	High
Francis,	On northwest corner Francis and Ashley streets	Forence,	8	8	2½	2	12	36	High
"	54′ east of east line of house No. 66	"	8	8	2½	2	12	36	High
Franklin,	On northwest corner Vine and Franklin streets	Chapman,	8	8	2½	4	12	135	High
Front,	On south side of street 12′ west of Commercial street	"	8	8	2½	4	24	60	Low
Gates Lane,	8′ south of south pier on driveway to Maple Hill	Florence,	8	8	2½	2	16	30	Low
" "	On north line of lot No. 9	"	8	8	2½	2	16	40	Low
Greenwood,	6′ 4″ south of driveway to Sewer Department Farm	"	8	8	2½	2	12	160	High
"	26′ 6″ south of south line of house No. 344	"	8	8	2½	2	12	165	High
Hadwen road,	38′ west of west line of house No. 6	"	6	6	2½	2	6	42	Low
Ingalls	Opposite house No. 18	"	6	6	2½	2	8	54	Low
Jacques,	54′ east of east end of Spencer Wire Co. Mill	"	6	6	2½	2	6	65	Low
May,	On north side of street 6′ west of west line of Park avenue	"	6	6	2½	2	16	125	High
"	On northeast corner May and Bradford streets	"	8	8	2½	2	16	120	High
Norfolk,	Opposite west line of Wye street on south side of street	"	6	6	2½	2	6	22	Low
North Ter.	18′ west of west line of house No. 45	Chapman,	6	6	2½	2	8	75	High
Plantation,	26′ south of south end of Hospital piggery	Florence,	6	6	2½	2	10	140	High
"	113′ north of north line of Curtis' house	"	6	6	2½	2	10	140	High
"	On corner Plantation and Gateway to Notre-Dame Institute	"	6	6	2½	2	10	145	High
Pleasant,	54′ west of west line of house No. 1001	"	8	8	2½	2	12	65	High
"	138′ east of east line of house No. 1034	"	8	8	2½	2	12	68	High
Summit avenue,	76′ west of west line of house No. 62	"	8	8	2½	2	12	45	High
Temple,	4′ east of west line of No. 13	"	8	8	2½	2	16	65	Low
"	On corner Burt and Temple streets	"	8	8	2½	2	16	66	Low
"	On southwest corner Temple ter. and Temple street	"	8	8	2½	4	16	65	Low



TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1904.

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1904	12,375	98	77,302	251,821	209,033	18,564	172,927	14,094	114,223	500	29,526	27,990	25,113	6,134	15,743	184.737	1,902	2,704
Laid in 1904	1,850		104	1,271	4,060	4,254	8,588	237	6,501	2,019		2,038				5.854	44	65
Total...	14,225	98	77,406	253,092	213,093	22,818	181,515	14,331	120,724	2,519	29,526	30,028	25,113	6,134	15,743	190.591		
Pipe taken up 1904...	1,699		727	2,759	691		1,210		53		6					1.353		
Total Feet.	12,526	98	76,679	250,333	212,402	22,818	180,305	14,331	120,671	2,519	29,520	30,028	25,113	6,134	15,743		1,946	2,769
Total Miles.	2.372	.018	14.522	47.411	40.227	4.321	34.148	2.714	22.854	.477	5.59	5.687	4.756	1.161	2.98	189.238		



KETTLE BROOK RESERVOIR NO. 2.

Rollway 507.5 feet.

KETTLE BROOK RESERVOIR NO. 3.

Rollway 559.00 feet.

KETTLE BROOK RESERVOIR NO. 4.

Rollway 601.74 feet.

LYNDE BROOK RESERVOIR.

Rollway 341.94 feet.

PARSONS' RESERVOIR.

Rollway 237.80 feet.

HOLDEN STORAGE RESERVOIR NO. 1.

Rollway 269.88 feet.

HOLDEN RESERVOIR NO. 2.

Rollway 237.80 feet.

HOLDEN DISTRIBUTING RESERVOIR.

Rollway 177.00 feet.

Elevation of Main street at City Hall above tide water, 481 feet.
Water pressure at City Hall, low service, 70 pounds.
Water pressure at City Hall, high service, 150 pounds.

In addition to the service pipes, which are reported in tabulated form, there have been fifty-six (56) changed, for which

826 feet of pipe was used in the streets, and 2008 feet on the premises of the owners.

Two thousand, four hundred and three (2403) feet of temporary mains have been laid, the persons thus supplied paying the expense of trenching and laying, and for pipe exceeding 100 feet.

The following tables will show rainfall at the reservoirs, sizes of pipe laid, also number of gates and hydrants set during the year.

TABLE.

SHOWING THE DAILY HEIGHT OF WATER IN HOLDEN RESERVOIR AND THE RAINFALL FOR THE YEAR ENDING NOVEMBER 30, 1904.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water	Rainfall.	Water.	Rainfall.
1	28.28		29.23		25.28		25.25	.81	30.27	1.32	31.22	.02	31.45		30.47	1.05	28.93	.09	27.13	.06	24.83		21.56	
2	28.21		29.20	.32	25.13		25.26	.63	30.39		31.30		31.43	.20	30.56	.11	28.90	.56	26.98		24.73		21.57	
3	28.20	.68	29.20	.48	24.93		25.27	.09	30.25		31.32		31.45	.40	30.53		28.85	.09	26.91		24.66		21.58	
4	28.15		29.17		24.75		25.69		30.12		31.30		31.45		30.36		28.78		26.78	.02	24.63		21.58	
5	28.08		29.13		24.60		26.03		30.17		31.32		31.45	.26	30.38	.82	28.68		26.73		24.33		21.58	
6	28.04		29.11		24.43	.29	26.13		30.18		31.30		31.47	.05	30.53	.02	28.60		26.68		24.03	.30	21.59	
7	28.03		29.07		24.22		26.22	.53	30.16	.23	31.36		31.54	.73	30.50	.02	28.51		26.56		23.58		21.59	
8	27.99		29.01		24.10		27.18	.59	30.21		31.43		31.60	.04	30.39		28.48	.35	26.43		23.10		21.59	
9	27.93		28.98	.46	24.18		28.54		30.28	.20	31.44	.67	31.59	.13	30.37		28.42		26.30	.39	22.91		21.60	
10	27.95	.66	28.95		24.19		29.02		30.58	1.17	31.58	.15	31.58		30.28		28.38	.39	26.23	.01	22.75	.05	21.59	
11	27.97		28.94		24.16		29.23		30.37		31.61	.22	31.57		30.25		28.33	.23	26.13		22.63	.07	21.60	
12	27.95		28.71		24.10		29.41		30.26	.28	31.61		31.55		30.16		28.28		26.03	.31	22.59	.24	21.58	
13	28.18	.83	28.45	.41	24.07		29.52		30.17		31.59		31.48		30.08	.10	28.21		25.93		22.48	.17	21.58	.38
14	28.37		28.27	.36	24.04		29.61		30.25	.01	31.57		31.42		30.04		28.13	.16	25.78		22.37			.87
15	28.42		28.02		24.01	.30	29.69	.10	30.25		31.51	.07	31.36		29.98		28.09			3.22	22.33		21.65	
16	28.42		27.79	.16	23.94		29.64		30.21	.43	31.56	.09	31.34		29.93		27.99	.04	26.34		22.23		21.64	
17	28.38		27.54		23.88		29.49		30.18		31.49	.06	31.30		29.87		27.95		26.28		22.08		21.66	
18	28.32		27.25		23.81		29.36	.40	30.26		31.52	.02	31.27		29.72	.20	27.91		26.16		21.97		21.61	
19	28.28		26.96		23.75	.12	29.22		30.26		31.57	.40	31.21		29.66		27.80		26.11		21.83		21.61	
20	28.25	.77	26.71	.07	23.68	.19	29.11	.12	30.43		31.65	.35	31.11		29.60		27.73	2.00	25.93		21.71		21.61	
21	28.95	.64	26.44		23.63		29.10		30.51	.03	31.57		31.04	.04	29.50		28.03	.15			21.63	1.12	21.61	
22	29.06	.14	26.17	.76	23.76	1.16	29.05	.07	30.14		31.60		31.06		29.48		27.86		25.65		21.77	.07	21.81	
23	29.10		25.96	.42	24.46		29.04	.01	30.15		31.59		31.95		29.38	.43	28.03		25.51		21.88		21.81	
24	29.13		26.04		24.88	.39	29.33		30.13		31.55	.08	30.86		29.36	.23	27.73		25.36		21.78		21.81	
25	29.16		26.17		25.02		29.58	.06	30.15	.11	31.48		30.76	1.11	29.38	.12	27.66		25.33	.15	21.56		21.97	
26	29.21	.22	26.21		25.09		30.12		29.86		31.46	.07	30.83		29.28	.06	27.58		25.21	.08	21.51	.11	21.73	
27	29.26	.06	26.18	.73	25.09		30.43		29.88	.93	31.51	.15	30.73		29.17		27.47		25.10		21.53		21.55	.04
28	29.28		26.00		25.08	.23	30.36		30.73	1.97	31.50		30.64		29.08	.04	27.41		24.98	.02	21.52		21.40	
29	29.28	.13	25.80	.05	25.18		30.30		31.60	.62	31.49		30.53	.42	29.16	.80	27.36		24.86	.52	21.52		21.26	
30	29.27		25.63	.16			30.28		31.65	.05	31.48	.07	30.50	.22	29.07		27.22		24.88	.05	21.53		21.07	.25
31	29.25		25.45				30.30				31.47	.10			28.98		27.15				21.56			
Totals.		4.13		4.38		2.68		3.41		7.35		2.52		3.60		4.00		4.06		4.83		2.13		1.54

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 30.10 feet.
Rainfall for year ending November 30, 1904, 44.63 inches.

TABLE.

SHOWING THE DAILY HEIGHT OF WATER IN LYNDE BROOK RESERVOIR AND THE RAINFALL FOR THE YEAR ENDING NOVEMBER 30, 1904.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	29.55		32.60		34.63		35.40	.86	35.53	.41	38.14		37.00		35.43	1.72	34.88	.06	33.28		31.20		28.59	
2	29.41		32.80		34.60		35.25		35.83	.92	38.10	.04	36.93	.19	35.75	.05	35.05	.80	33.18	.01	31.09		28.53	
3	29.28	.54	33.05	.84	34.58	.01	35.05	.67	36.07		38.04		36.90	.33	35.84		35.00		33.00		31.00		28.57	
4	29.14	.16	33.27		34.56		35.21		36.07		38.00		36.88		35.87		35.05		32.96	.04	30.84		28.60	
5	29.04		33.31		34.52		35.20		36.07		37.90		36.92	.36	35.75	.87	35.05		32.83		30.73		28.60	
6	28.90		33.40		34.52	.32	35.05		36.03		37.80		36.92	.10	35.81	.05	34.97		32.85		30.60	.17	28.60	
7	28.80		33.56		34.55	.13	34.88		36.00	.26	37.77		37.13	.48	35.82	.01	35.04		32.70		30.50		28.60	
8	28.60		33.62		34.63		35.50	1.02	36.00		37.74		37.19	.03	35.86		34.95	.47	32.66		30.37		28.55	
9	28.54		33.70	.44	34.74		36.15		36.00	.17	37.70	.92	37.38	.03	35.88		35.05		32.60	.35	30.30		28.50	
10	28.57	.65	33.61		34.76		36.25		36.50	1.23	37.90	.17	37.48	.28	35.83		35.00		32.40	.05	30.20		28.50	
11	28.50		33.56		34.80		36.18		36.63	.01	38.00	.22	37.50		35.80		35.04	.57	32.33		30.06	.03	28.50	
12	28.40		33.52		34.77		36.05		36.68	.30	37.94		37.43		35.73		35.00		32.24	.09	29.85	.05	28.46	
13	28.45	.79	33.48	.31	34.77		35.88		36.77		37.90		37.35		35.58	.11	34.95		32.08	.31	29.85	.44	28.45	
14	29.15		33.61	.38	34.72		35.65		36.80		37.84		37.26		35.46		34.95	.36	32.00		29.78	.01	28.56	1.38
15	29.16		33.71		34.70	.31	35.50		36.78		37.77	.01	37.15		35.43		34.97		32.32	3.09	29.66		28.55	
16	29.16		33.73		34.61		35.30	.14	36.78	.47	37.75	.17	37.04		35.20		34.96		32.73		29 63		28.60	
17	29.07		33.73	.16	34.63		35.10		36.78		37.66		36.86		35.20		34.80		32.77		29.58		28.57	
18	28.95		33.75		34.50		34.82	.39	36.78		37.66	.05	36.82		35.17	.17	34.64		32.74		29.47		28.52	
19	28.83		33.76		34.50		34.60	.02	36.68		37.63	.15	36.71		35.04		34.58		32.68		29.24		28.54	
20	28.79	.20	33.71	.06	34.45	.19	34.50	.10	36.70		37.68	.39	36.60		34.97		34.48	1.95	32.51		29.15		28.55	
21	30.00	1.18	33.73	.05	34.40		34.50		36.63	.04	37.73		36.43	.03	34.87		34.73	.08	32.40		29.10	1.18	28.60	
22	30.05	.11	33.79	.55	34.55	1.05	34.40		36.56		37.68		36.33		34.80		34.68		32.30		29.30	.04	28.67	
23	30.00		33.90	.65	35.15		34.40	.14	36.50		37.61		36.21		34.80	.25	34.40		32.10		29.26		28.72	
24	30.46		34.16		35.33	.41	34.53		36.40		37.55	.03	36.05		34.89	.02	34.32		31.95		29.16		28.80	
25	30.56	.01	34.35		35.48		34.84		36.35	.13	37.40		35.90		34.85	.35	34.25		31.80	.13	29.12		28.80	
26	31.13	.21	34.45		35.50		35.22		36.25		37.28	.15	35.90	.61	34.80	.07	34.15		31.76		29.00	.14	28.80	
27	31.38	.12	34.53	.68	35.47		35.60		36.25	.14	37 20	.32	35.70		34.88	.03	33.97		31.64	.10	28.93		28.80	
28	31.70		34.55		35.45		25.65		36.74	1.85	37.12		35.66		34.98		33.88		31.54	.01	28.80		28.74	.03
29	32.00		34.60		35.40	.22	35.63		37.70	1.49	37.07		35.56	.39	35.02	.57	33.70		31.43		28.64		28.68	
30	32.20	.12	34.60	.24			35.56		38.08	.27	37.16		35.46	.08	35.05		33.55		31.38	.77	28.64		28.59	.17
31	32.40		34.63				35.52				37.05	.14			35.02		33.38				28.62			
Totals,		4.09		4.36		2.64		3.34		7.69		2.76		2.91		4.27		4.29		4.95		2.06		1.58

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 37.40 feet. Rainfall for the year ending November 30, 1904, 44.94 inches.

LENGTH AND SIZE OF NEW PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1904.

STREET	LOCATION	PIPE		HYDRANTS	GATES	SERVICE
		Size in Inches	Length in Feet			
Apricot	From Wildwood avenue to Main street	12	421		1	High
Arbor Vitae	" Main street, northerly	8	439	1		Low
Ashley	" Summit avenue to Francis street	8	271		1	High
Blaine avenue	" Main street, southerly	8	421	1		Low
Bradley avenue	" Brooks avenue, northerly	8	108		1	High
Chrome	" Orient street, easterly	8	248	1	1	"
Church place	" Pleasant street, southwesterly	8	196		2	"
Farley avenue	" Burncoat street, westerly	12	759	1	1	"
Forest	" end of pipe northerly	16	1,340	2	4	"
Francis	" Ashley street, northerly	12	556	1	1	"
Franconia	" June street, northwesterly	6	152		2	Low
Franklin	" Trumbull to Vine street	12	458	1	1	High
Gates Lane	" Main street, westerly	16	814	2	1	Low
Grafton	" Union square, southeasterly	16	90		1	High
Greenwood	" end of pipe southerly	12	1,695			
		10	314	2	2	"
Hadwen road	" June street, westerly	6	441	1	2	Low
Hamilton	" Warner avenue east to Hamilton street	2	1,850			High
Harlem	" Vernon street, westerly	8	202			"
Jacques	" end of pipe easterly	6	145	1		Low
		4	104			High
May	" Park avenue to Lovell street	16	1,873	2	4	
		18	254			"
Norfolk	" Bloomingdale road, westerly	6	533	1	1	Low
North terrace	" Shannon street, westerly	8	294	1	1	High
Plantation	" Belmont st. to Notre Dame Normal Ins.	10	3,940			
		12	1,800	3	7	"
Pleasant	" Moore avenue, westerly	12	1,977	2	2	"
Summit avenue	" Burncoat to Ashley street	12	345	1		"
Vine	" Franklin street, northerly	12	186		2	"
Wilson	" Seward street, easterly	8	818	2	3	Low
Wye	" Bloomingdale road, southerly	8	307		1	"
			23,351	26	42	

LENGTH AND SIZE OF PIPE RELAID DURING THE YEAR ENDING NOVEMBER 30, 1904.

STREET.	LOCATION.	PIPE.		Hydra'ts	Gates.	SERVICE.
		Size in Inches.	Length in Feet.			
Bloomingdale Road	From Grafton to Suffolk Street,	18″	1765	4	7	High.
Front,	From Main to Summer Street,	8″	206	1	4	Low.
		12″	391			
		14″	237			
		24″	2038			
Ingalls,	From Vernon to Fox Street,	8″	550	1	2	Low.
Temple,	" Grafton to Green Street,	16″	1215	3	3	"
Winter,	" Grafton to Green Street,	16″	1169	1	3	"

Location, Size and Kind of Hydrants Located During the Year Ending November 30, 1904.

Street	Location.	Kind.	Size.	Size of Connections.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Arbor Vitae,	At north end of street opposite house No. 11	Florence.	6	6	2½	2	8	32	Low
Blaine avenue,	On north line of lot No. 11	"	6	6	2½	2	8	26	Low
Bloomingdale road,	82′ east of east line of Grafton street	"	8	8	2½	4	16	140	High
" "	43′ west of west end of Boston & Albany brick freight house	"	8	8	2½	2	16	140	High
" "	12′ east of west line of No. 32	"	8	8	2½	2	16	138	High
" "	114′ west of west line of wooden tannery building, on south side of street,	"	8	8	2½	2	16	135	High
Chrome,	On east line of lot No. 21	"	6	6	2½	2	8	100	High
Farley avenue,	71′ east of east line of Hunt's house No. 52	"	8	8	2½	2	12	47	High
Forest,	14′ 6′ north of north line of Wheeler's barn	Chapman.	6	6	2½	2	16	85	High
"	On north line of Allen's tenement house lot	"	6	6	2½	2	16	100	High
Francis,	On northwest corner Francis and Ashley streets	Forence,	8	8	2½	2	12	36	High
"	54′ east of east line of house No. 66	"	8	8	2½	2	12	36	High
Franklin,	On northwest corner Vine and Franklin streets	Chapman,	8	8	2½	4	12	135	High
Front,	On south side of street 12′ west of Commercial street	"	8	8	2½	4	24	60	Low
Gates Lane,	8′ south of south pier on driveway to Maple Hill	Florence,	8	8	2½	2	16	30	Low
" "	On north line of lot No. 9	"	8	8	2½	2	16	40	Low
Greenwood,	6′ 4″ south of driveway to Sewer Department Farm	"	8	8	2½	2	12	160	High
"	26′ 6″ south of south line of house No. 344	"	8	8	2½	2	12	165	High
Hadwen road,	38′ west of west line of house No. 6	"	6	6	2½	2	6	42	Low
Ingalls	Opposite house No. 18	"	6	6	2½	2	8	54	Low
Jacques,	54′ east of east end of Spencer Wire Co. Mill	"	6	6	2½	2	6	65	Low
May,	On north side of street 6′ west of west line of Park avenue	"	6	6	2½	2	16	125	High
"	On northeast corner May and Bradford streets	"	8	8	2½	2	16	120	High
Norfolk,	Opposite west line of Wye street on south side of street	"	6	6	2½	2	6	22	Low
North Ter.	48′ west of west line of house No. 45	Chapman,	6	6	2½	2	8	75	High
Plantation,	26′ south of south end of Hospital piggery	Florence,	6	6	2½	2	10	140	High
"	113′ north of north line of Curtis' house	"	6	6	2½	2	10	140	High
"	On corner Plantation and Gateway to Notre-Dame Institute	"	6	6	2½	2	10	145	High
Pleasant,	54′ west of west line of house No. 1001	"	8	8	2½	2	12	65	High
"	138′ east of east line of house No. 1034	"	8	8	2½	2	12	68	High
Summit avenue,	76′ west of west line of house No. 62	"	8	8	2½	2	12	45	High
Temple,	4′ east of west line of No. 13	"	8	8	2½	2	16	65	Low
"	On corner Burt and Temple streets	"	8	8	2½	2	16	66	Low
"	On southwest corner Temple ter. and Temple street	"	8	8	2½	4	16	65	Low

Washington square,	20′ west of Summer street	Chapman,	8	8	2½	4	24		High
Wildwood avenue,	On northwest corner Wildwood avenue and Apricot street	Florence,	8	8	2½	2	12	85	High
Wilson,	On east line of lot No. 23	"	8	8	2½	2	8	52	Low
"	On northeast corner Wilson and Marshall streets	"	8	8	2½	2	8	56	Low
Winter,	8′ west of west line of Harding street	"	8	8	2½	2	16	66	Low
	PRIVATE HYDRANTS.								
Bloomingdale road,	Grafton and Knight.–On south line of brick building, 400 'S. of S. line of Rd.	Florence,	6	6	2½	2		135	High
Brussels,	M. J. Whittall. In yard	Chapman,	8″	8	2½	4		80	Low
"	" " " "	Florence,	8	8	2½	2		80	Low
May,	Mary E. Norcross—On premises	"	6	6	2½	2	16	80	High
Plantation,	Notre-Dame Normal Institute, 33′ 6″ S. of S. line of building, 28′ east of west line of same	"	6	6	2½	2	10	145	High

TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1904.

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1904	12,375	98	77,302	251,821	209,033	18,564	172,927	14,094	114,223	500	29,526	27,990	25,113	6,134	15,743	184.737	1,902	2,704
Laid in 1904	1,850		104	1,271	4,060	4,254	8,588	237	6,501	2,019		2,038				5.854	44	65
Total...	14,225	98	77,406	253,092	213,093	22,818	181,515	14,331	120,724	2,519	29,526	30,028	25,113	6,134	15,743	190.591		
Pipe taken up 1904...	1,699		727	2,759	691		1,210		53		6					1.353		
Total Feet.	12,526	98	76,679	250,333	212,402	22,818	180,305	14,331	120,671	2,519	29,520	30,028	25,113	6,134	15,743		1,946	2,769
Total Miles.	2.372	.018	14.522	47.411	40.227	4.321	34.148	2.714	22.854	.477	5.59	5.687	4.756	1.161	2.98	189.238		

SERVICE PIPES LAID TO NOVEMBER 30, 1904.

	In the Street.		Premises of Individuals.		No.
	Feet.	Miles.	Feet.	Miles.	
Prior to 1887	171,603.36	32.498	188,386.48	36.676	7,629
1887	9,674.	1.832	11,418.25	2.162	469
1888	8,814.75	1.669	13,872.	2.627	431
1889	10,021.75	1.898	11,264.5	2.133	472
1890	9,300.58	1.761	13,972.9	2.644	449
1891	9,307.5	1.762	14,276.66	2.704	483
1892	10,012.58	1.896	12,803.25	2.424	506
1893	8,616.25	1.631	11,064.	2.095	430
1894	7,218.	1.367	11,035.	2.09	366
1895	7,469.	1.414	12,407.	2.35	366
1896	7,067.83	1.34	8,796.	1.66	346
1897	8,324.11	1.576	9,805.2	1.857	383
1898	7,291.	1.38	12,878.75	2.439	342
1899	7,234.25	1.37	12,134.	2.298	336
1900	6,047.25	1.126	8,241.5	1.56	284
1901	6,506.75	1.232	7,291.25	1.38	315
1902	4,604.	.872	7,255.	1.374	225
1903	6,027.	1.141	10,054.	1.904	297
1904	5,596.	1.059	8,529.5	1.615	284
	310,735.96	58.824	385,485.24	72.992	14,413

WATER CART HYDRANTS, 1904.

Ætna,	Near Coral St., 10′ 6″ out from stand pipe.
Austin,	24′ 6″ W. of W. line of Queen St., 11′ 6″ out from stand pipe.
Benefit,	59′ 7″ E. of E. line of Beacon St., 15′ 10″ S. of N. line of street, 26′ 6″ out from stand pipe.
Bloomingdale Road,	104′ E. of E. line of Grafton St. (S.), 15′ 9″ N. of S. line of street, 22′ out from stand pipe.
"	7′ 8″ out from stand pipe.
Bowdoin,	13′ E. of E. line of Chestnut St., 5′ N. of stand pipe.
Bridge,	36′ 6″ W. of W. line of viaduct wall (S.), 20′ 4″ out from stand pipe.
Burncoat,	21′ E. of W. line of street, 18′ 9″ N. of N. line of Melville St.
Cambridge,	12′ 6″ S. of N. line of street, 3′ 6″ E. of W. line of Southbridge St.
"	16′ 9″ S. of N. line of street, 25′ E. of E. line of Douglas St.
"	11′ 6″ out from stand pipe.
" cor. Douglas	15′ S. of N. line of street, 25′ E. of E. line of Douglas St.
Carroll,	7″ out from stand pipe.
Chandler,	43′ 6″ W. of W. line of Newbury St., 20′ 9″ out from stand pipe.
near Park Ave.,	30′ W. of W. line of Park Ave., 7′ 3″ out from stand pipe.
" " Bellevue,	16′ E. of W. line of Wright's new machine shop, 24′ 8″ N. of stand pipe.
Chatham,	75′ 6″ E. of E. line of Houchin Ave., 12′ out from stand pipe.
Commercial,	20′ S. of N. line of Central St., 18′ E. of W. line of Commercial St.
Congress,	51′ 6″ W. of W. line of Crown St., 18′ out from stand pipe.
Crescent,	23′ 8″ out from stand pipe.
Crown,	4′ 4″ out from stand pipe.
Cutler,	6′ 3″ N. of N. line of Union Ave., 18′ 6″ out from stand pipe.
Eastern Ave.,	Near Belmont St., 19′ 10″ out from stand pipe.
E. Central near Ford,	26′ 2″ out from stand pipe.
Elm,	North side, about 100′ W. of Chestnut St., about 12′ E. of elm tree, 9′ 2″ out from stand pipe.
Florence,	8′ 7″ out from stand pipe.
"	25′ N. of N. line of Charlotte St., 16′ E. of W. line of Florence St.
"	20′ 5″ S. of S. line of May St., 26′ 10″ out from stand pipe.
Foster,	12′ 8″ out from stand pipe.
Front,	63′ 7″ W. of W. line of Church St., 64′ N. of stand pipe.
Fruit near Dayton,	7′ out from stand pipe.
Garden,	54′ 3″ W. of W. line of Lincoln St., 19′ 6″ N. of S. line of Garden St., 23′ 9″ out from stand pipe.
Gold,	E. side, about 30′ S. of catch-basin, S. side of Bradley St., 20′ out from stand pipe.
Grand,	16′ 6″ E. of E. line of Illinois St., 26′ 6″ out from stand pipe, 5′ 9″ out from stand pipe.
" near Douglas,	8′ 10″ out from stand pipe.
Green,	27′ 8″ N. of S. line of Crompton's shop, 14′ 4″ out from stand pipe.
Grove,	49′ S. of S. line of Lexington St., 34′ 3″ out from stand pipe.
"	End of wire mill, 7′ 9″ out from stand pipe.
"	Near North St., 8′ 6″ out from stand pipe.
Hermon,	14′ 4″ from S. line of barn wall on N. W. corner Southbridge and Hermon Sts., 30′ 2″ W. of E. line of barn, 9′ 10″ south of stand pipe.
"	9′ 6″ S. of N. line of Hermon St., 27′ E. of E. line of Main St.
Highland,	7′ 9″ out from stand pipe.
"	14′ W. of W. line of Boynton St., 10′ 3″ S. of stand pipe.
"	43′ E. of E. line of Westland St., 22′ 9″ out from stand pipe.
"	31′ 6″ out from stand pipe.
"	Near Newton Sq., 32′ 6″ out from stand pipe, 1′ 6″ E. of centre of stand pipe.
Hollywood,	S. of May St., 6′ 10″ out from stand pipe.
Home,	North side, front of school-house lot, opposite end of Wesby St., 6′ 8″ out from stand pipe.
Hudson,	59′ 6″ S. of S. line of Elm St., 26′ out from stand pipe.
Institute Road,	Near Beechmont St., 3′ 4″ out from stand pipe.
"	Near West St., 2′ 6″ out from stand pipe.
Jaques Ave.,	West side, between two trees front of school-house lot, 8′ 6″ out from stand pipe.
King,	17′ W. of W. line of Queen St., 24′ out from stand pipe, ¾″ stop, 17′ 9″ W. of W. line of Queen St., 22′ 3″ out from stand pipe
"	7′ 10″ out from stand pipe.
Lafayette,	13′ S. of N. line of street, 31′ W. of W. line Quinsigamond Ave. ¾″ stop, 11′ 2″ S. of N. line of street, 32′ W. of W. line Quinsigamond Ave.
Lagrange,	50′ S. of S. line of Beacon St., 20′ out from stand pipe.

WATER CART HYDRANTS (*continued*).

Lake,	19′ 9″ out from stand pipe.
Lancaster,	14′ S. of S. line of Institute Rd., 27′ out from stand pipe.
Lincoln,	10′ 9″ N. of N. line of Perkins St., W. of Lincoln St., 14′ out from stand pipe.
Lodi,	4′ 3″ out from stand pipe.
Madison,	7′ 2″ W. of W. line of Southbridge St., 22′ 8″ out from stand pipe.
Main,	At Hammond St., 7′ W. of stand pipe.
"	22′ 9″ W. of E. line of Main St., 35′ N. of N. line of Gertrude Ave.
"	Near Grand St., 34′ N. of N. line of Downing St., 53′ E. of W. line of Main St., 3′ 6″ W. of stand pipe.
"	Opp. Marble St., 9′ 3″ out from stand pipe.
"	Near University Park, 9′ N. of stand pipe, 2′ 10″ out from stand pipe.
"	Near Park St., 25′ S. of stand pipe on branch of two-way hydrant, 1′ 8″ W. of E. line of curbstone.
	11′ 7″ N. of N. line of Park St.
Mill,	13′ 6″ N. of N. line of Quinn's block, 27′ out from stand pipe.
Millbury,	Near the mill, 1′ 9″ W. of stand pipe, 2′ out from stand pipe.
"	Near Seymore St., 10′ W. of E. line of street, 13′ 9″ S. of N. line of Seymore St.
"	Near Greenwood St., 6′ N. of stand pipe.
"	Below the ledge, 2′ 6″ N. of stand pipe.
"	S. of Cambridge St., 13′ 3″ W. of E. line of street, 62′ 9″ N. of N. line of Whitney St.
Merrick	107′ S. of S. line of Davis Ct., 7′ out from stand pipe.
Mulberry,	15′ E. of W. line of street, 27′ 3″ N. of N. line of Asylum St. 22′ 6″ out from stand pipe.
Newbury,	E. side, opposite division fence N. of Austin St., 6′ 9″ out from stand pipe.
Oak Ave.,	18′ 9″ E. of W. line of avenue, 26′ N. of N. line of Belmont St. (W).
Orange,	E. side, near Myrtle St., 6′ S. of electric light pole, 5′ 9″ out from stand pipe.
Orient,	3″ valve, 21′ N. of N. line Hamilton St., 18′ 8″ E. of W. line of Orient St.
	¾″ stop, 17′ 6″ E. of W. line of street, 22′ 3″ N. of N. line of Hamilton St.
Oxford,	15′ S. of S. line of Pleasant St., 8′ out from stand pipe
Paine,	Near Perkins St., 8′ out from stand pipe.
"	Near Vinton St., 9′ 6″ out from stand pipe.
Park Ave.,	Box on Lovell St., 28′ 3″ S. of stand pipe, 12′ E. of W. line of Park Ave.
"	7′ out from stand pipe.
"	98′ 6″ N. of N. line of house No. 194 Park Ave., 18′ 10″ out from stand pipe.
Penn Ave.,	15′ 9″ E. of W. line of avenue, 20′ 4″ S. of S. line of avenue.
Piedmont,	33′ 6″ N. of N. line Brigham St., 22′ out from stand pipe.
Plantation,	13′ 8″ N. of N. line Shrewsbury St., 9′ 8″ W. of E. stone wall corner Shrewsbury and Plantation Sts.
	26′ 4″ N. W. from stand pipe.
Pond,	Corner Harding St., 7′ 9″ out from stand pipe.
Prescott,	2′ 6″ out from stand pipe.
"	Above wire mill, 9′ 10″ out from stand pipe.
"	Near North St., 21′ out from stand pipe.
Richards,	8′ out from stand pipe.
Salisbury,	18′ 6″ W. of W. line of Dean St., 7′ out from stand pipe.
"	Corner Park Ave., 8′ 10″ out from stand pipe.
Sheridan,	Box on Shrewsbury St., 27′ N. of S. line of street, 12′ E. of W. line of Sheridan St.
Shrewsbury,	12′ 3″ N. of S. line of Shrewsbury St., 18′ W. of W. line of schoolhouse fence.
Sigel,	66′ 6″ W. of W. line of Harding St.
Southbridge,	Near Prov. & W. R. R., 9′ 3″ out from stand pipe.
Southgate,	26′ 9″ W. of W. line of Southbridge St., 24′ 6″ out from stand pipe.
Sturgis,	S. side, opposite greenhouse, about 200 feet from Lincoln St., 20′ 5″ out from stand pipe.
Summer,	17′ 3″ E. of W. line of street, 66′ 6″ S. of S. line of Central St.
Sycamore,	S. side, in front of school-house lot, 16′ 6″ out from stand pipe.
Tainter,	Near Kilby St., 23′ 6″ W. of W. line of Tainter St., 21′ 6″ out from stand pipe.
Temple,	29′ 8″ S. of N. line of street, 22′ 10″ E. of W. line of Jourdan's barn.
Tufts,	W. side, near division fence, N. of No. 2, 7′ out from stand pipe.
Vernon,	21′ 9″ E. of E. line of Richland St., 10′ 6″ out from stand pipe.

WATER CART HYDRANTS (*continued*).

Wall,	Near Norfolk St., 26′ out from stand pipe.
Ward,	3′ 6″ out from stand pipe.
"	19′ 6″ W. of W. line of Wade St., 17′ 6″ out from stand pipe.
Washington,	21′ 6″ N. of N. line Plymouth St., 15′ 10″ W. of E. line Washington St.
	¾″ stop, 21′ 6″ N. of N. line Plymouth St., 17′ 6″ W. of E. line of Plymouth St., 19′ 3″ out from stand pipe.
Water,	8′ 9″ out from stand pipe.
Waverley,	N. side, 6′ E. of third tree W. of Coral St., 8′ 10″ out from stand pipe.
Westminster,	7′ 6″ out from stand pipe.
William,	7′ out from stand pipe.
"	7′ 3″ out from stand pipe.
Windsor,	N. of Harrington Ave., 19′ out from stand pipe.
Winslow,	15′ 9″ S. of S. line of Pleasant St., E. of Winslow St., 22′ out from stand pipe.
Winthrop,	Near Providence St., 6′ 3″ N. of stand pipe.
Woodland,	12′ 10″ N. of S. line of school-house lot, 6′ 10″ out from stand pipe.
"	Near Downing St., 2′ 8″ out from stand pipe.
Wyman,	22′ 9″ S. of S. line of Hollis St., 22′ 9″ out from stand pipe.

CAR SPRINKLING HYDRANTS.

Belmont,	22′ 6″ S. of N. line of street, 36′ W. of W. line of Oak Ave.
Bloomingdale Road,	At corner Putnam Lane.
Boynton,	17′ 4″ E. of W. line of street, 39′ N. of N. line of Highland St.
Burncoat,	14′ 6″ E. of W. line of street, 94′ S. of S. line of engine house.
East Worcester,	At Shrewsbury St., 3′ 3″ S. of S. line of Shrewsbury St., 14′ 4′ E. of W. line Norcross Bros.' office.
Franklin Sq.,	35′ W. of E. line of Main St., 14′ N. of S. line of Allen Ct.
Fremont,	21′ 6″ S. of N. line of street, 74′ E. of E. line of house No. 22.
Grafton,	22′ N. of S. line of street, 1′ E. of E. line of Houghton St.
"	51′ 4″ W. of E. line of Grafton St., 14′ S. of N. line of Keese St.
Grove,	Near North St., 29′ S. of S. line of North St., 17 6″ W. of E. line of Grove St.
Highland,	12′ 4″ S. of N. line of street, 14′ W. of W. line of 162 Highland St.
June,	17′ W. of E. line of June St., 56′ N. of N. line of Chandler St., looking west.
Lincoln,	At house No. 160.
"	24′ W. of E. line of street, 14′ 2″ S. of N. line of Perkins St.
Main,	16′ 7″ W. of E. line of street, 11′ 3″ N. of N. line of Beaver St.
"	39′ 4″ N. of S. line of street, 88′ W. of W. line of McMullen lot 14.
"	20′ S. of N. line of Main St., 86′ 6″ E. of E. line of Lake St.
"	31′ N. of S. line of street, 5′ 6″ W. of W. line of ell part of house 1482 Main St.
"	19′ W. of E. line of street, 23′ S. of S. line of Hammond St.
Mill,	18′ W. of E. line of street, 31′ N. of N. line of Main St.
Millbury,	N. of Sigel St., 6″ gate on hydrant will shut this off.
"	26′ W. of E. line of street, 10′ N. of S. line of Maxwell St.
"	11′ 6″ W. of W. line of street, 15′ S. of N. line of Perry St.
Park Ave.,	21′ W. of E. line of Park Ave., 76′ S. of S. line of Fern St.
"	23′ 8″ W. of E. line of Park Ave., 39′ N. of S. line of Harrington & Richardson's shop.
Pleasant,	15′ S. of N. line of street, 9′ 6″ E. of W. line of 137 Pleasant St.
"	19′ 6″ S. of N. line of street, 32′ 9″ W. of W. line of Park Ave.
"	20′ S. of N. line of street, 151′ W. of W. line of 414 Pleasant St.
"	3″ valve, 18′ W. of E. line of Pleasant St., 3′ 6″ S. of N. line of Wetherell's farm house.
Providence,	107′ S. of N. line of S. pier to Crompton's driveway, 20′ 3″ E. of W. line of Providence St.
Salem,	34′ 6″ S. of S. line of Front St., 26′ 6″ W. of E. line of Salem Sq.
Salisbury,	19′ W. of E. line of street, 23′ 8″ N. of N. line of Lincoln Sq. This gate shuts to the right.
"	3″ valve, 36′ 6″ E. of E. line of Park Ave., 19′ S. of N. line of Salisbury St.
Shrewsbury,	115′ S. of N. line of Hunt St., 20′ W. of E. line of Shrewsbury St.
Southbridge,	426′ 6″ S. of N. line of Lafayette St., 17′ 6″ W. of E. line of Southbridge St.
Summer,	17′ E. of W. line of street, 29′ S. of S. line of Prospect St.
Vernon,	18′ 8″ W. of E. line of street, 24′ S. of S. line of Union Ave., looking west.
Washington Sq.	43′ 6″ W. of W. line of Summer St., 40′ 8″ N. of S. line of Front St.
Webster,	3′ 8″ E. of E. line of street, 9′ 2″ N. of S. line of Jacques St.
West Boylston,	Near Fair Grounds, 1′ S. of S. rail in center of turn-out, near Fair Grounds.
West Boylston,	Near Huntington Ave., 16′ W. of E. line of W. Boylston St., 52′ S. of S. line of Huntington Ave.

DRINKING FOUNTAINS.

Belmont,	Cor. Plantation St., 24′ E. of W. line of Plantation, 3′ 4″ N. of S. line of Belmont St.
Cambridge Sq.,	On Millbury St., 30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
Franklin Sq.,	14′ 3″ E. of E. line of Scott's block, 20′ 3″ N. of N. line of same.
Front,	Cor. Salem Sq., 65′ 6″ from base of fountain, 42′ 9″ W. of W. line of Church St.
"	Cor. Summer St., on Summer St., 26′ E. of W. line of street, 8′ 8″ N. of N. line of Front St.
Lincoln Sq.,	Cor. Main St., shut off on sidewalk.
Millbury,	Cor. Reeves St., 1′ 6″ W. of W. line of Millbury St., 27′ 9″ S. of N. line of Reeves St.
Vernon Sq.,	22′ 4″ S. of N. line of Vernon St., 8′ S. of N. line of house 108 Water St., 8′ E. of W. line of Water St.
Webster Sq.,	30′ 9″ N. of S. line of Cambridge St., 25′ 6″ W. of W. line of Webster St.

WATERING TROUGHS.

Adams Sq.,	20′ W. of E. line of Lincoln St., on S. line of Shattuck St.
Belmont,	At Lake 11′ 6″ S. of S. line of Belmont St., 34′ 7″ E. of W. line of Lake Ave.
Chadwick Sq.,	29′ S. of hydrant, 35′ 6″ E. from watering trough.
Chandler,	10′ 2″ E. of W. line of Bellevue St., 16′ 8″ S. of N. line of Chandler St. W.
"	31′ 6″ N. of S. line of Chandler St., 6′ 9″ E. of W. line of Mill St.
Coes Sq.,	11′ 4″ W. of E. line of street, 19′ N. of N. end of parapet wall, 42′ 10″ S. of S. line of Coes shop, 56′ 8″ S. of S. line of Beaver St.
Grafton,	Cor. Hamilton St., 16′ 5″ S. of N. line of street, 32′ 6″ N. of trough, 100′ 6″ W. of W. line of Orient St.
James,	14′ out from centre of trough, ¼ rod stop, 11′ 9″ out from centre of trough.
Lincoln Sq.,	43′ 8″ S. of N. line of Lincoln Sq., 10′ 3″ W. of W. line of Prescott St.
Millbury,	30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
"	At Greenwood St., 26′ 4″ directly east from trough.
Pleasant,	7′ 3″ out from X on trough near the ground.
Southbridge,	33′ 2″ from W. line of Southbridge St., 28′ S. of S. line of Southgate St.
"	At Madison St., 32′ 9″ out from trough at Madison Sq., 36′ 6″ S. of S. line of 114.
"	At Stearns Sq., 6′ 3″ out from trough, 1′ 8″ S. from trough. Drip: 4′ S. of trough, 2′ 6″ W. of E. end of trough.
Vernon Sq.,	On Vernon St., 5′ 6″ above gate-box, 6′ 9″ out in direct line from where it enters the trough.
Washington Sq.,	On Shrewsbury St., W., 36′ 6″ S. of N. line of street, 60′ E. of E. line of Summer St.
Webster Sq.,	15′ 9″ W. of line of Webster St., 30′ 10″ N. of S. line of Cambridge St.

Expended 1904.

WATER WORKS CONSTRUCTION.

Salary of Commissioner, John G. Brady,	$978 48
Salary of Commissioner, Geo. W. Batchelder,	966 67
Payrolls, laborers,	16,096 27
Clerical service,	1,183 26
Abatements,	3 46
Blank books, stationery and stamps,	29 46
Brick and freight on same,	11 25
Car tickets and transportation of laborers,	10 00
Carpentering and lumber,	25 52
Castings, patterns and fire clay,	1,441 13
Cordage, waste and packing,	191 42
Engineers' services and materials,	53 98
Express, freight and trucking,	909 52
Fuel,	8 11
Hack and horse hire,	46 00
Hardware, tools and repairs,	178 02
Hydrants, water gates, valves and repairs,	1,700 56
Inspection of pipe,	112 68
Iron pipe and freight on same,	14,612 99
Iron and steel,	87 84
Lead pipe and lead,	310 96
Meters and repairs,	2,786 48
Meters and repairs Union Water Meter Co.,	5,852 19
Meters taken out,	27 00
Miscellaneous supplies,	2 17
New England Telephone and Telegraph Co., rental and service,	1 90
Paints, oils and painting,	14 56
Pipe, fittings, etc.,	976 73
Powder and fuse,	130 21
Printing,	10 00
Refreshments for committee and guests,	20 00
Repairs, sewers,	11 53

Repairs, streets,	187	54
Rubber goods,	6	75
Sewer pipe, cement and sand,	71	51
Special castings for iron pipe,	1,177	44
Telegrams and telephone tolls,	4	21
Traveling expenses,	9	81
Patrick Manning, injury to person,	63	57
		$50,311 18

PIPE EXTENSION AND IMPROVEMENT ACCOUNT.

Payrolls, laborers,	$7,368	06
Carpentering and lumber,	228	51
Castings, patterns and fire clay,	642	51
Cordage, waste and packing,	58	95
Engineers' services and materials,	65	99
Express, freight and trucking,	921	53
Fuel,	4	55
Hardware, tools and repairs,		78
Hydrants, water gates, valves and repairs,	3,372	62
Iron pipe and freight on same,	17,539	01
Lead pipe and lead,	2,165	79
Paints, oils and painting,	5	85
Repairs, sewers,	208	00
Repairs, streets,	931	42
Special castings for iron pipe,	1,298	56
Stone posts, wall stone and labor,	5	40
Team work,	6	91
Telegrams and telephone tolls,	1	56
Testing pipe,	327	45
Repairs, Millbrook sewer arch,	256	36
		$35,409 81

HOLDEN SUPPLY.

Payrolls, laborers,	$489 83	
Carpentering and lumber,	3 11	
Express, freight and trucking,	8 10	
Sewer pipe, cement and sand,	48 16	
Walker Ice Co., damage to boiler,	400 00	
		$949 20

KETTLE BROOK SUPPLY.

Payrolls, laborers,	$85,302 56
Appraisal of damages,	15 00
Blank books, stationery and stamps,	11 26
Boilers, engines and repairs,	1,147 77
Brick and freight on same,	295 64
Car tickets and transportation of laborers,	2 50
Carpentering and lumber,	1,762 07
Carts, wagons and repairs,	18 85
Castings, patterns and fire clay,	70 75
Cordage, waste and packing,	219 63
Engineers' services and materials,	4,534 57
Express, freight and trucking,	2,255 75
Extra labor, sundry persons,	51 98
Fuel,	1,484 11
Hack and horse hire,	210 50
Hardware, tools and repairs,	893 04
Hose and couplings,	73 40
Hydrants, water gates, valves and repairs,	183 05
Iron pipe and freight on same,	2,138 95
Iron and steel,	121 79
Lead,	19 35
Legal expenses,	203 56
Lime,	1 10
Machinery, belting and repairs,	16 85

Medical attendance on horses,	3 50
Miscellaneous supplies,	134 09
Paints, oils and painting,	200 46
Pipe, fittings, etc.,	184 93
Powder and fuse,	775 94
Printing and photographing,	13 31
Railway supplies,	1,008 82
Recording deeds,	12 45
Rent of barn,	104 00
Rent of machinery,	252 00
Rubber goods,	552 46
Sewer pipe, cement and sand,	8,532 49
Stone crusher and repairs,	317 25
Team work,	15,961 64
Telegrams and telephone tolls,	2 17
Traveling expenses,	1 76
Services expert engineer and witnesses Lakeside case,	2,958 01
Building telephone line,	51 52
Refreshments for committee and guests,	12 70
Copper roofing,	47 15
Samuel B. Parsons, damage to property,	1,363 00
Services, stenographer,	182 70
Locomotives and repairs,	411 42
Walter E. Clark, land,	981 00
George W. Cowden, trustee, land,	833 33
Town of Leicester, land,	7,000 00
Railway cars,	1,113 50
H. B. Watts, rent of land,	200 00
Lakeside Mfg. Co., damages,	23,120 80
Laying Water Pipe at Keep farm,	193 86
Blankets, harness and repairs,	11 70
Granite spillway,	862 84
Material for gatehouse,	82 36
	$168,517 19

Value of stock and tools on hand November 30, 1904, $113,-816.78.

Bills have been rendered to the City Treasurer to the number of 2321, amounting to $28,370.82.

Number of abatements forty-two, amounting to $545.19.

Amount of bills in hands of Treasurer November 30, 1904, $6,076.33.

Amount collected during the year $25,100.27.

Respectfully submitted,

GEO. W. BATCHELDER,
Water Commissioner.

December 19, 1904.

REPORT OF WATER REGISTRAR.

To the Honorable City Council of the City of Worcester.

Gentlemen: In compliance with section 7, chapter 48, of the City Ordinances, the report of the income division of the Water Department for the year ending November 30, 1904, is presented.

Two hundred and ninety-four (294) applications for water were received during the year and placed in the hands of the Water Commissioner.

The following bills were given the Treasurer for collection:

For metered water,	26,337	bills, amounting to	$285,986 50
For annual rates,	601	bills, amounting to	7,466 27
Total bills,	26,938	Total amount,	$293,452 77

Total amount of revenue received during the year ending November 30, 1904, $293,794.02. Of this amount $4,124.68 was from uncollected bills in the hands of the Treasurer November 30, 1903.

The amount of uncollected bills in the hands of the Treasurer November 30, 1904, was $2,317.63.

During the year the sum of $1,959.05 has been abated owing to changes from annual rates to metered rates, vacant tenements, and adjustment of bills of water takers. $958.79 was transferred.

Seventy-four services were shut off for non-payment of bills, and, with very few exceptions, these bills have been paid and water turned on.

The quantity of metered water furnished during the year ending November 30, 1904, was as follows:

Domestic purposes,	676,141,827 gallons.
Manufacturing purposes,	382,488,436 gallons.
Steam and electric railways,	211,112,189 gallons.
Elevators,	243,465,755 gallons.
Motors,	4,404,526 gallons.
Schools,	25,393,713 gallons.
Churches,	3,339,800 gallons.
Hotels,	15,587,820 gallons.
Hospitals,	57,700,865 gallons.
Stables,	7,401,225 gallons.
Laundries,	21,750,829 gallons.
Fire Department houses,	3,410,027 gallons.
Sewage purification works,	3,389,625 gallons.
Stores, offices, saloons, shops, etc.,	102,505,889 gallons.
Total metered water,	1,758,092,526 gallons.
Unmetered water (estimated),	27,000,000 gallons.
Street sprinkling,	93,693,000 gallons.
Merrifield estate,	4,505,000 gallons.
Total,	1,883,290,526 gallons.

From the two latter amounts, street sprinkling and Merrifield estate, no revenue is received.

The number of new meters set during the year was 283, making the total number now in use 13,634.

Kinds.	Sizes.										
	⅝	¾	1″	1½″	2″	3″	4″	6″	8″	10″	Total.
B. and F. Piston	535	46			5						586
Columbia	1										1
Crown	9	2									11
Desper	277	10									287
Duplex	1										1
Empire	1										1
Gem	1		1		1	4	10	4		3	24
Hersey	733	43	2	1	2		1				782
Hersey disc	1,093										1,093
Keystone	2										2
Lambert	20										20
Nash	87										87
Shedd	1										1
Torrent			1			1	2	1			5
Trident	184	1									185
Union Rotary	9,365	443	221	178	207	103	21	6	1		10,545
Worthington	3										3
Total	12,313	545	225	179	215	108	34	11	1	3	13,634

During the year 2 Desper, 153 Hersey, 228 Hersey disc, 7 Lambert, 13 Nash, 4 B. & F. Piston, 2521 Rotary and 46 Trident meters have been taken off for repairs. Most of them have been repaired at the department shop without cost to the owner. Total cost of repairs $10,911.50.

Eight new elevators have been put in during the past year, making the total 395.

Dwellings, Persons, Fixtures, etc., Assessed for Water in the City of Worcester.

Dwellings,	12,466	Baths,	18,717
Families,	26,100	Water-closets,	34,522
Stores,	1,479	Hose,	10,128
Offices,	1,360	Boilers,	2,982
Saloons,	69	Horses,	5,073

Markets,	101	Cows or oxen,	830
Shops,	640	Elevators,	395
Stables,	2,249	Barber shops,	163
Persons using,	121,990	Hotels,	31
Sinks,	33,547	Schools,	71
Basins,	20,586	Motors,	46

RECEIVED.

For assessments for water, 1903,	$4,124 68	
For assessments for water, 1904,	289,669 34	
Accrued interest,	1,334 95	
Apples,	57 13	
Board of horse,	36 00	
Coal,	2 06	
Hay and grain,	486 68	
Laying pipe at Keep farm,	121 32	
Miscellaneous supplies,	214 15	
Refuse materials,	1 85	
Rubber goods,	90 00	
Wood,	3 00	
		$296,141 16

EXPENDED.

Amount transferred to interest on water loan,	$154,662 50	
Amount transferred to sinking fund, per order City Council,	6,150 00	
Running expenses,	64,744 40	
		$225,556 90
Balance transferred to sinking fund (water bonds),		$70,584 26

Detailed Account of Expenditure.

Salary of Registrar, George W. Batchelder,	$826 64
Salary of Registrar, George C. Hunt,	702 21
Clerical service,	2,079 85
Service of canvassers,	454 62
Service of meter readers,	5,798 24
Care of reservoirs,	2,064 00
Payrolls, laborers,	33,007 02
Abatements of water rates,	148 38
Appraisal of damages,	10 00
Blacksmithing and blacksmiths' supplies,	327 97
Blank books, stationery and stamps,	375 21
Blankets, harness and repairs,	279 50
Books and subscriptions,	26 00
Car tickets and transportation of laborers,	410 10
Carpentering and lumber,	237 72
Carts, wagons and repairs,	466 72
Castings, patterns and fire clay,	253 04
Chemical analyses (water samples),	102 00
Cordage, waste and packing,	254 53
Damage by bursting pipe,	99 00
Engineers' services and materials,	312 81
Express, freight and trucking,	117 91
Extra labor (sundry persons),	7 90
Fuel,	463 49
Furniture, fixtures and repairs,	100 00
Gas,	128 00
Hack and horse hire,	168 50
Hardware, tools and repairs,	926 09
Hay, grain and straw,	1,716 06
Hose and couplings,	203 41
Hydrants, water gates, valves and repairs,	253 07
Insurance,	22 28
Iron and steel,	188 01
Loam, fertilizer and seeds,	44 55

Medical attendance on horses,	19 00
Meters and repairs,	690 98
Meters and repairs (Union Water Meter Co.),	5,658 85
Miscellaneous supplies,	97 64
New England Telephone & Telegraph Co., rental and service,	68 41
Paints, oil and painting,	321 96
Pipe, fittings, etc.,	325 50
Printing and photographs,	413 28
Putting up meter cards,	128 74
Refreshments for committee and guests,	111 00
Refreshments for laborers,	32 50
Rent of land for watering trough (B. & A. R. R. Co.),	1 00
Rent of land Woodward St.(M. J. Whittall),	300 00
Repair of buildings,	40 22
Repair of sewers,	82 80
Repairs at shop,	81 17
Repair of streets,	120 36
Rubber goods,	79 10
Services of expert engineers,	1,202 00
Sewer pipe, cement and sand,	187 32
Special castings for iron pipe,	22 20
Stone posts, wall stone and labor,	6 54
Taxes in Holden,	159 24
Taxes in Leicester,	273 45
Taxes in Paxton,	152 92
Team work,	946 88
Traveling expenses,	15 98
Watering streets,	6 36
Building manholes,	155 31
Building telephone line,	62 86
Repair of fountains,	2 45
Building sewer drain,	23 30

Fannie S. Putnam, injury to person,	150 00	
Wire fencing,	169 00	
Guarding railroad track,	4 75	
Repairing gatehouse,	26 50	
Boat,	30 00	
		$64,744 40

Revenue.

The total amount of revenue received from the collection of water rates during the financial year ending November 30, 1904, was $293,794.02, the largest in the history of the department, and an increase of $23,142.36 over the preceding year.

The appended table shows the revenue, also the increase in revenue since 1890.

	Revenue.	Increase.
1890	$140,293 71	
1891	148,332 04	$8,038 33
1892	164,638 19	16,306 15
1893	185,564 63	20,926 44
1894	185,940 02	375 39
1895	200,255 51	14,315 49
1896	207,295 65	7,040 14
1897	210,064 16	2,769 51
1898	222,006 33	11,942 17
1899	238,462 14	16,455 81
1900	262,175 74	23,713 60
1901	259,429 06	—2,746 68
1902	269,428 64	9,999 58
1903	270,651 66	1,223 02
1904	293,794 02	23,142 36

Inspection.

The excellent system of inspection inaugurated by my predecessor has been continued during the past year with very

satisfactory results. This system is maintained by the city at considerable cost, but I think the results attained warrant the expenditure. During the past year, 3780 houses have been inspected and 2095 notices have been sent to the owners notifying them of leaks in the water fixtures in their premises, and I am very glad to say that in almost every case the parties notified have stopped the leaks immediately, thereby preventing a large waste of water, which, in the present condition of our water supply, is of the utmost importance, and also saving them from paying large water bills.

METERS.

During the past year 283 new meters have been installed by this department, making a total of 13,634 meters in use. These meters require the constant care and attention of this department, and are kept in repair by the city at a very large expense. In response to the recommendation of the Water Registrar that all private fire pipes entering buildings be metered, the following ordinance was adopted by the City Council July 11: "Section 1. It shall be the duty of the Water Commissioner to at all times be diligent to prevent waste of city water and to make such examinations, investigations and tests as to such wastes, arising from all causes, as shall conduce to the most economical use of water. Section 2. The Water Commissioner shall cause suitable meters to be placed on all private fire mains, the expense of such meter and the installation thereof shall be borne by the person, corporation, or partnership using such fire main."

The requirements of the above ordinance have not as yet been carried out, but it is the desire of this department that these meters be installed at once and I would respectfully recommend that the necessary appropriation to enable the Water Commissioner to do this work be made at as early a date as possible. With the completion of this work, Worcester

will have one of the most complete and extensive meter systems of any city in the country.

Remarks.

The year 1904 has been an unusually prosperous one with the Water Department. For the first time in many years the revenue of the department is more than sufficient to pay its operating expenses, interest charges and contribution to the sinking funds required by law. The collections for the past year have been very satisfactory. The total amount assessed to water takers was $299,029.49. Of this amount, $293,794.02 has been paid, $1,959.05 abated and $958.79 transferred, leaving a balance of $2,317.63 unpaid at the end of the fiscal year.

I am indebted to the Water Commissioner for his valuable assistance and hearty co-operation and I desire to commend those connected with this office for the faithful and intelligent service they have rendered.

Respectfully submitted,

GEORGE C. HUNT,

Water Registrar.

REPORT OF THE CITY ENGINEER.

CITY ENGINEER'S OFFICE, DEC. 12, 1904.

To the Honorable City Council of the City of Worcester.

Gentlemen : I have the honor to submit the following report for the Engineering Department for the year ending November 30, 1904, as follows :

STREETS.

Preparatory to action by the City Council, decrees for the laying out and making public of 10 streets, with a total length of 2.00 miles have been prepared, a list of which is exhibited in the following table :

STREETS LOCATED FROM DECEMBER 1, 1903, TO DECEMBER 1, 1904.

Street	From	To	Width Feet.	Length, Feet	Date of Decree	Remarks
Alpine	Seymour	Vernon	40	859.93	Dec. 5, '04	
Beechmont	Salisbury	Institute Rd.	50	2665.92	Dec. 5, '04	
Bradford	Parker	May	40	643.07	Sept. 26, '04	
Chrome	Orient	Plantation	40	558.86	Dec. 5, '04	
Cornell	Richmond Ave.	Vassar	50	250.10	Dec. 19, '04	
Englewood Ave	Lovell	Circuit Ave.	45	1550.00	Nov. 14, '04	
Granite	Winthrop	St. Anne's	60	2448.00		
		Orphanage	50		Oct. 4, '04	Reloc.
Harrison	Providence	Barclay	50	947.80	Dec. 19, '04	
Newport	Liberty	Edward		375.75	Dec. 19, '04	
Sturgis	Windsor	Uxbridge	40	269.96	Dec. 5, '04	
Total length				10,569.39		

For the construction and paving of streets, the grade and sectional stakes were set for the streets named in the following table:

Street	From	To	Length, Feet	Remarks
Beaver	Park Avenue	Beaver St. bridge.	500.00	Macadam
Birch	Maywood	Beaver	1,248.56	
Bradford	May	Parker	643.07	
Cambridge	Southbridge	Canterbury	2,653.70	Macadam
Chandler	Queen	Park Avenue	1,972.00	Block paving
Cherry	Vine	Canal	335.40	Block paving
Church	Front	Mechanic	334.10	Brick paving
Dartmouth	Plantation	Columbus Avenue	959.95	
Dupont	Hamilton	Chrome	376.17	
Eastern Avenue	Mulberry	Normal	220.20	Lateral gutters
Fremont	Cambridge	Sutton Lane	708.00	Macadam
Front	Main	Washington Sq.	1,902.50	Block paving
Grafton	Union Square	Waverley	1,085.30	Bitulithic
Granite	Winthrop	St. Anne's Orph'ge	2,448.00	
Grove	Ice House	Holden Street	761.80	Macadam
Highland	Boynton	West	668.90	Bitulithic
Jacques	Webster	(Easterly)	494.35	
Louise	Vernon	Upsala	901.45	
Newton Avenue	Newton Square	Midland	311.85	
Pelham	Merrick	Russell	418.53	
Perry	Millbury	(Westerly)	894.40	
Pleasant	Main	(Westerly)	129.00	Block paving
Salem	Park	Myrtle	775.60	Block paving
Sutton Lane	Fremont	R. R. bridge	228.20	Macadam
Temple			48.90	F'nt of St. John's Ch.
Uxbridge	Washington Ave.	Shaffner	1,301.11	
Vinson	Rodney	Stanton	469.62	
Warren	Cherry	Front	201.70	Block paving
Windsor	Allen estate	Green Lane	965.98	
Total length			23,958.34	

Decrees for the establishment of sidewalk grades, preparatory to further action by the City Council were provided for the following named streets :

Street	From	To	Date of Decree	Length, Feet	Side
Elbridge	Boynton	West	Dec. 5, '04	1,184.38	Both sides
Grove	North	Sagamore Road	Nov. 14, '04	328.70	West
Loudon	Woodland	Main	Sept. 26, '04	478.50	West Reloc.
Main	Apricot	(Westerly)	July 11, '04	650.00	North
Main	Brookline	Henderson Ave.	Oct. 4, '01	387.00	North
May	Park Ave.	Fairfield	July 11, '04	758.00	South
Orient	Grafton Sq	Division	July 11, '04	1,208.00	West
Park Avenue	Salisbury	(Northeasterly)	Dec. 5, '04	375.00	West
Vinson	Rodney	Stanton	July 11, '04	940.00	Both sides
West	Highland	Institute Road	Dec. 5, '04	607.80	East
Institute Road	Boynton	West	Dec. 19, '04	625.90	South
Total length				7,542.76	

Stakes for the alignment and grade of curbstones were set as follows :

Street	From	To	Length, Feet	Remarks
Berwick	Pleasant	(Northerly)	118.25	West side
Catharine	Lincoln	Westminster	450.00	North side
Catharine	Hooper	Eastern Avenue	175.00	South side
Chandler	Bellevue	(Easterly)	468.00	North side
Cherry	Vine	Canal	656.00	Both sides
Elbridge	Boynton	West	1,184.38	Both sides
Elm	Merrick	Russell	505.00	South side
Endicott	Ward	Vernon	910.00	North side
Front	Salem Square	(Westerly)	431.30	South side
Grove			115.00	West s. front Dodge Est
Houghton	Grafton	Union Avenue	1,353.00	West side
Institute Road	Boynton	West	1,280.40	Both sides
Lancaster	Highland	Institute Road	310.90	East side
Larch	Merrick	Winslow	510.00	North side
Ledge	Water	Waverley	609.00	East side
Lee	Park Avenue	Institute Road	700.00	East side
Loudon	Woodland	(Southerly)	100.00	West side
Main	Brookline	Henderson Ave.	384.11	North side
Main			205.80	West of Apricot street
Market	B. and M. R. R.	(Easterly)	110.00	North side
May	Park Avenue	Fairfield	759.80	South side
Monroe Avenue	Pleasant	Franconia	300.00	
Pleasant	Berwick	(Westerly)	131 70	North side
Plympton	Reeves	Whipple	136.86	East side
Providence	Union Avenue	Crompton Est.	540.00	East side
Reeves	Greenwood	Plympton	1,228.50	Both sides
Shaffner			160.00	North side continuation
Suffolk	Wall	Norfolk	1,070.80	East and North sides
Wall	Norfolk	(Southerly)	97.00	West side
Warren	Front	Cherry	202.85	East side
West	Highland	Institute Road	607.85	East side
Westminster	Harrington Ave.	Mt. Vernon	280.40	East side
Windsor	Mt. Vernon	Opp. Allen Est.	448.41	East side
Woodland	Loudon	(Westerly)	138.00	South side
Worth	Millbury	Ward	418.83	North side
Cambridge	Pitt	Sherman	232.00	Reset. South side
Harvard Place	Harvard	(Easterly)	340.00	Reset. Both sides
Institute Road	Salisbury	Lancaster	681.95	Reset. South side
Linden	Elm	(Southerly)	311.60	Reset. East side
Salem	Park	Myrtle	1,515.90	Reset. Both sides
Chandler	Queen	Park Avenue	1,322.30	Reset. Both sides
Church	Front	Mechanic	445.00	Reset. Both sides
Front	Main	Washington Sq.	1,292.80	Reset. Both sides
Grafton	Union Square	Penn Avenue	725.00	Reset. North side
Total length			23,963.69	

The measurement and estimation of cost of construction, the re-establishment of the grade, and plans provided for street numbering are presented in the adjoining tables of respective streets :

MEASUREMENT AND ESTIMATION.

Street	From	To	Length, Feet	Remarks
Cambridge	Millbury	Kansas	804.50	Granite block
Chandler	Queen	Park Avenue	1,972.00	Granite block
Church	Front	Mechanic	334.10	Mack brick
Grafton	Union Square	Wall	2,292.40	Bitulithic
Grove	Ice House	Holden Street	761.80	
Highland	Boynton	West	668.90	Bitulithic
James	Stafford	(Southerly)	130.00	Gutter
Pleasant	Main	(Westerly)	129.00	Granite block
Shrewsbury	Mulberry	East Worcester	616.30	
Stafford	Grand View Ave.	(Easterly)	1,014.00	Gutter
Total length			8,723.00	

RE-ESTABLISHMENT OF GRADE.

Street	From	To	Length, Feet	
Young	Main	Stafford	427.33	

STREETS RENUMBERED.

Street	From	To	Length, Feet	Remarks
Heardaleigh	Summer	Fountain	407.60	
Hobson Avenue	Englewood Ave.	(Easterly)	318.00	
Houghton	Grafton	Heywood	2,777.90	
Otsego Road	Monadnock Road.	Forest	714.00	
Providence	Harrison	Ætna	419.40	East side
Uxbridge	Green Lane	Shaffner	2,202.60	
Total length			6,839.50	

The following is a summary of street work for general purposes :

	Number or length in feet
Street bounds set,	57
Street bounds readjusted,	418
Line and grade given on application,	154
Locations examined and approved for electric light conduits,	11
" " " " " " " poles,	174
" " " " " gas pipes,	18
" " " " " telephone conduits,	11
" " " " " water pipes,	9
Number of surveys for improvement of surface drainage,	2
" " " to determine encroachments,	3
" " " for relaying sidewalks and crosswalks,	3
" " " for grass plat at street intersection,	1
" " " for the Law Department,	1
" " " for measurement of material in gravel pit,	1

Numerous levels were taken for the adjustment of manhole heads to street cross-sections.

Eleven plans of street locations were made and filed, and duplicates supplied for recording, and fifteen sectional maps of the city prepared for the foremen of the department.

The bridge over the Blackstone river at Quinsigamond being in an unsatisfactory condition, it was deemed advisable to relieve the trusses from stress, and in accordance with plans from this department, the floor system of the bridge was set on timber bents, placed in the river bed.

This temporary expedient was adopted by reason of possible changes in the grade crossing, to which the bridge is an approach.

Your attention is also invited to the condition of the bridges on Webster and June streets, which are badly out of repair and should be replaced with masonry structures.

SEWERS.

The sewer constructions for the year have been somewhat less than similar work during the past eight years, the aggregate for the season amounting to 3.81 miles, a little less than one-half of which being designed for surface drains. The usual plans, gradients and general supervision of construction being provided by this department.

Several additions were made to the sewage purification plant, as extended operations proved desirable, three and one-half acres of new filters being built similar in design to those previously constructed; a grit chamber and double contact beds also being important additions, and adding materially to the efficiency of the plant.

A reproduction of the plans of these structures will be found in the Superintendent's report.

Two storage chambers were added to the Lake View sewage system, adjoining the ejector chambers in Belmont street.

Forty-two plans were furnished the department during the year, together with the necessary duplicates for recording.

446 house drains were inspected during the year, and gradients given therefor.

WATER.

The order of the City Council, adopted February 1, 1904, to repair and strengthen the dam at Paxton, has been carried on through the past season and brought to a completion. It is a source of satisfaction to have this dam and reservoir in a suitable condition for use, and that its former decrepit state no longer exists.

It will be recalled that this structure was breached the latter part of last year, it being considered too insecure for further use. The partial tearing down of the dam this season gave positive proof that its reconstruction was begun none too soon. Before ceasing work last year, a new draft pipe with valves was

enclosed in masonry and laid in the excavations made for draining the reservoir, and by this means the work of the early part of the season was greatly assisted.

During the winter months much of the equipment that had been in use the previous season at the Manville reservoir was transported to the site of the new work, and other preparations made in anticipation for the following summer. With the advent of spring the work was commenced in earnest and continued with but few interruptions for the remainder of the season.

The dam as reconstructed has a length of 1158 feet, and a horizontal width on top of 18 feet. The neat width on top is 15.70 feet, with a slope toward the basin. The inside face has a slope of 2 on 1, with a berm 5 feet in width at an elevation of 5 feet below the level of the weir, and the back face has a slope of 3 on 1. The earthen part of the structure was raised from 4 to 5 feet above the top of the old dam, and the crest of the weir is 3 feet higher than formerly.

The new part of the work is placed on the upstream side of the old embankment, the face of which was removed to procure the desired space for the masonry features. A concrete core wall extends the entire length of the dam and well into the hills at either end, and additional protection is afforded by a grouting of the pavement throughout the higher portions. The top of the core wall is two feet above the level of the weir, and its thickness at this point is two feet. The concrete for the wall was mixed in proportion of one part Lehigh Portland cement, 2½ parts crusher sand and 5 parts broken stone, and was plastered on the upstream face. Crusher sand was used almost entirely and gave excellent satisfaction. The foundations for the core wall were carried to firm ledge throughout where the depth of water exceeded 13 feet, and for the remaining distance was founded on a very compact hard pan. The excavations reached the maximum depth of 24.90 feet below the draft pipe, and for the greater part were remarkably free from water. The earthen portion of the new structure is formed of selected ma-

terial, principally hard pan, placed in layers sufficiently thin to admit of thorough compacting, sprinkled when required and rolled with a grooved roller. The entire surface exposed to wave action is protected by a heavy riprap, and the top and back side of the embankment is loamed and graded.

The spillway which has been in use was built in 1896, and being composed largely of good ashler stone was utilized as far as possible. Most of the side walls were left intact, and with the new additions a satisfactory construction was obtained. The valve chamber was placed near the toe of the outer slope of the embankment, and is composed of Portland cement concrete, with a superstructure of yellow brick. The wall contains two Chapman valves, one for emergency purposes and a tell tale pipe for obtaining the depth of water in the reservoir at any stage. A driveway on the back slope of the dam leads to the structure. By raising the flow line to the height now obtained, it became necessary to construct a dyke at the northwesterly part of the reservoir to prevent the water from flowing over the divide into the valley of the Turkey Hill brook. The dyke is 600 feet in length, the interior part being built of loam, sprinkled and rolled and faced with gravel. The inside face has a slope of 4 on 1, and is riprapped with field stone. On the back side of the dyke a considerable amount of the spoil excavated from the basin is placed, it being a convenient location for depositing this material.

The cleaning of the reservoir has called for active work the entire season. Heavy deposits of mud were encountered throughout the greater part of the basin, and as but few places for disposing of the material were of access to the trains employed, the length of haul at times was excessive. Two trains were kept busy for the entire summer, the last of the mud being removed the first of the present month. In order to prepare the material for removal, ditching was resorted to, and by a system of small dykes and the use of centrifugal pumps the work was kept fairly free from water. In certain areas it was found impracticable under the circumstances to remove all the mud, and in these

cases the remaining portions were covered with gravel. 50,113 car loads of mud and vegetable matter were removed, and 18,000 yards of gravel placed in covering. The shores and other places that were not convenient for train service were cleaned by teams. The maximum force employed at any one time was 346 men, 62 single and 9 double teams, and two locomotives with 32 cars.

It is a satisfaction to report that the work has been accomplished for a few thousand dollars less than the estimated cost.

With the completion of this dam and reservoir, the full development of Kettle Brook is brought to a close, but before the waters of the stream are satisfactory, attention should be given to ditching one or two localities, and to the improvement of the small tributary known as Peter brook. This stream has a drainage area of about one-half square mile, but has been of very little service since its acquisition by the city, due to the doubtful quality of the water, and the stream has accordingly been diverted. The brook in my opinion is of sufficient value and importance to warrant the utilization of its run off, and I therefore recommend that sand filters be constructed in the vicinity of the Gallagher meadows, so-called, and the waters turned through them before being made use of.

The various reservoirs and dams are in a generally satisfactory condition, with the exception of the spillway at Lynde brook reservoir, which has become more or less disturbed by the action of frost, and should receive a general overhauling and repair.

The consumption of water during the past year is largely in excess of any like period within the history of the department, and shows a marked effect upon the reservoirs. At the present writing the reservoirs upon Kettle brook are practically empty, with but a total storage upon Lynde and Tatnuck brooks of about 800,000,000 gallons. The consumption at the present rate is above 300 million gallons of water a month, with hardly sufficient water in the brooks to provide for the evaporation.

The rainfall for the year is quite up to the average, only show-

ing a falling off for the past two months, and yet we are watching the depleting basins with some apprehension. If a short period of dryness like the present occasions disquiet, what shall be said for an extended season of drouth such as experienced within recent years. The daily consumption is constantly on the increase, and should be provided for in sufficient amount to preclude any possibility of a scare at the first suspicion of dryness. Additional water of a suitable character cannot be procured on short notice, and it would seem the part of prudence to make a beginning toward an additional supply that shall be in readiness when needed. I respectfully renew my former recommendations respecting this question.

The following table shows the monthly and annual, and the average daily consumption of water, in gallons, for the fiscal year :

Months	Consumption per Month	Average Monthly Consumption	Average Daily Consumption per Month	Average Daily Consumption for the year
December.....	282,362,520		9,108,468	
January	300,336,960		9,688,289	
February	294,525,000		10,156,034	
March	311,459,720		10,047,088	
April	301,982,560		10,066,085	
May	320,892,000		10,351,355	
June	312,888,400		10,429,613	
July.....	323,315,520		10,429,533	
August	326,599,240		10,535,459	
September	321,654,960		10,721,832	
October.....	326,404,760		10,529,186	
November.....	300,075,160		10,002,505	
		310,208,066		10,170,756

The maximum consumption of water for one day amounted to 12,835,680 gallons, and the average daily gallons per consumer, 83.

Recent tests for electric currents along the water mains in different localities, show an alarming and unreasonable condition of affairs, that if allowed to continue will undoubtedly result in irreparable damage to the water distribution pipes throughout the city. I deem it of the greatest importance that the conditions under which the railway and other companies may use

uninsulated electric return circuits in the streets of this city shall be defined by ordinance. The gravity and importance of this question demands your immediate attention.

MISCELLANEOUS.

The surveys of a miscellaneous nature are as scheduled below :

For Public Buildings,
Surveys of estates, batters and levels for grading, 8

For the Parks Commission,
Survey of proposed playground, 1

For Law Department,
Survey of boundary line, 1

Excerpts of conveyances have been procured and platted for the Assessors Department, together with surveys of estates and mapping of the same.

Measurements and additions to the plats of Hope Cemetery have been made as requested by the superintendent.

The number of office plans for various purposes made and filed amount to 115.

The several hearings for the abolition of grade crossings have required additional plans and estimates.

In recognition of the efficient and faithful services of my assistants, I express my appreciation and thanks therefor.

Respectfully submitted,

FRED'K A. McCLURE,

City Engineer.

ANNUAL REPORT

OF THE

Water Commissioner

the Water Registrar and the City Engineer

OF THE

CITY OF WORCESTER

YEAR ENDING NOVEMBER 30, 1909

VII-A



APR 1909

ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR, AND THE

CITY ENGINEER

OF THE

CITY OF WORCESTER

FOR THE

YEAR ENDING NOVEMBER 30, 1905.

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WATER COMMITTEE.

Alderman GEORGE N. WHITE,
Alderman THOMAS A. CALLAHAN,
Alderman JOHN J. POWER,
Councilman EDWIN S. CLARK,
Councilman IRA B. HUBBARD,
Councilman M. FILLMORE KELSEY,
Councilman CHARLES A. OSTROM

WATER COMMISSIONER.

GEORGE W. BATCHELDER.

WATER REGISTRAR.

GEORGE C. HUNT.

REPORT OF WATER COMMISSIONER.

To the Honorable City Council of the City of Worcester.

Gentlemen:—In compliance with Section 4, Chapter 48, of the City Ordinances, the report of the Water Commissioner for the year ending Nov. 30, 1905, is respectfully presented.

Reservoirs.

An unusual amount of work has been done on the reservoirs in the year just passed. On the Kettle Brook system a large amount of ditching was done at the old Arnold location and the meadows and swamps adjacent. This work, while not completed, partially accomplishes the desired result, and the condition of the water as it leaves the swamp is very much improved. It is believed that still further improvement can be made by adding to the present system of ditches, and the department urges the prosecution of this work at an early date.

At Holden No. 1 advantage has been taken of the low water to strip the shores of the vegetable growth and deposits of earth, which have been injurious to the water. Men and teams have been working on these shores for several weeks, and the conditions are greatly improved.

There is no doubt this work will materially reduce the liability of bad tasting water from this source, where we have had considerable trouble at times during the past two years.

Minor repairs have been made at the various reservoirs, gatehouses and buildings of care takers, with the intention of keeping the city property in first-class condition.

Frequent and careful inspections have been made to see that no person shall do anything to cause danger to the purity of our water supply.

It is the policy of the department to do everything possible to keep the water in the best of condition, and in this effort it has

been ably assisted by the State Board of Health, and the local Health Board.

REVENUE.

The revenue division of the department, in charge of the Registrar, continues to show commendable and successful activity.

The amount collected during the past year is far in excess of the revenue for any previous year, and the department is now on a self-supporting basis, where it will remain.

FINANCES.

This department would have been self-supporting for several years, if it had been vested with authority to collect from all users of its product among the city departments. In this connection may be mentioned the street sprinkling department, which takes from the city's mains millions of gallons annually, without paying one cent for it.

The department has repeatedly asked for authority to collect this amount, which is approximately $10,000 a year, but has been unable to carry the point. If this cannot be paid to the department in cash, it should be credited on its financial statement.

Another reason why the department has not been shown in the proper light is because its revenues from the premium on water bonds have been used for the support of other departments, leaving this department to carry the burden of interest and sinking fund charges on all water bonds sold. In one year alone, 1899, $25,000 for the School Department, and $2,500 for the Public Library, were taken from the premium on the sale of water bonds. In the years from 1897 to 1903 $130,000 was taken from the Water Department in this way.

How much better and more accurate the showing of this department would have been had this money, which rightfully belonged to it, been allowed to go where it now does, by order of the City Council, to the sinking fund of the loan which created the premium.

Long lines of pipes have been laid costing many thousands of dollars, which no private company would have put in without a surety of good interest on the investment.

The city's policy has been more liberal; it has tried to supply with water its citizens in the most remote districts, and is rapidly succeeding in doing so in a satisfactory manner.

These lines have not paid in cash for the sale of water; their cost during the past ten years will figure over $100,000, but they have furnished water and valuable fire protection to our citizens, and have done much to stimulate building.

The amount of taxable property which has been built because of these water mains is difficult to estimate, but it must run up high in the thousands, and the process is still going on.

The records of cash received and paid out for the Water Department have, during some years, shown an excess of expenditures over receipts, for the reason given above, but the department is now self-supporting, and will continue so, notwithstanding some of the conditions mentioned are still in existence. If the city had laid only pipe lines which would pay, it would never have been necessary to appropriate any money for water works construction.

Most of the heavy expenditures for pipe lines have been made, receipts have caught and are now exceeding expenditures, and the whole proposition is working out to a condition which the department presents for the consideration of your honorable body.

No money was appropriated from the tax levy of 1905 for the Water Department. The water construction account was for the first time in many years provided for by a transfer from the water revenue.

Pipe improvement was provided for by a loan, on which the department pays interest and sinking fund charges.

A transfer of $1,500 was made from the liquor license money to enable the department to put in water mains in streets where new buildings were being erected.

The need of cleaning the shores at Holden Reservoir No. 1 was of so much importance that a transfer of $4,000 liquor license money was made for that purpose.

The revenue from the sale of water proved to be large enough to take care of these items, in addition to all others, but was not received early enough to be available for use during the period when work could be done to the best advantage.

During the coming year no appropriation from the tax levy will be necessary for this department. A loan for pipe improvement should be made, but it can be taken care of by the revenue from the sale of water.

Draft.

For the purpose of comparison the draft is given for 1904-1905: 1904, 3,739,925,200; 1905, 3,517,396,800; decrease, 1905, 222,528,400.

With a draft of 222,528,400 gallons less in 1905 than in 1904 the revenue increased $14,593.71.

Storage.

The conditions of Worcester's water supply are such that the reservoirs must be filled each spring, or a dry season following, failure to fill, would cause a serious shortage of water.

Two dry years have occurred in succession; they may again at any time, and then the water supply would be found inadequate.

No large sum of money need be expended immediately for reservoir construction, but it seems important that work be soon started in the direction of Asnebumskit brook, so that its waters may be promptly conveyed to Worcester when it becomes necessary.

Waste Water.

For several years the draft of water increased very rapidly, so much so that it was commented on in inaugural addresses of some of our chief executives.

Acting under authority of the chief executive, the department has at various times made tests where it thought water was escaping from its mains. Reports of these tests have been made promptly to the Mayor.

The department, for several years, asked for authority to set meters on fire mains. This authority was granted in 1904, funds for doing the work were made available early in the present year, and the department began operations. It was found at once that the insurance interests had to be considered, their opposition to meters overcome, and also the consumer's objection to the expense.

Details of how the department enforced the ordinance to prevent waste of water cannot be given here in full.

With very few exceptions every fire pipe in Worcester is covered either by a meter or a device, which prevents water being drawn without the knowledge of the department.

The few remaining fire pipes will be covered, as soon as the owners are able to get in position the mechanism to which we attach our meter. The record of our draft, during the past year, tells the story of the good results following the installation of meters on fire pipes, and justifies the department's request for authority to do so. Worcester now has a system of controlling the draft of water through fire mains which is in advance of any other city in the country, though the question of waste water concerns them all.

We believe the problem of waste water has been solved, metering of fire pipes has reduced our draft very materially, notwithstanding the fact that the city is much larger than it was a year ago; our rate per capita is less, though increased population usually increases the per capita, and our percentage of water accounted for is far in advance of anything we have ever shown before, and we believe is better than any other large system of water works in the whole country can show.

Electrolysis.

Five permanent stations have been constructed where readings can be made to determine the flow of electricity in our water mains.

We are thus enabled to keep in touch with conditions and if anything appears to indicate danger to our system, it can be promptly dealt with.

Conclusion.

In conclusion I wish to say I appreciate the support and assistance rendered me during the past year.

Summary of Statistics.

Dates of construction: 1845, 1864, 1883, 1895, 1896, 1900, 1901, 1902, 1903, 1904.
Source of supply: Impounding reservoirs in the towns of Leicester, Paxton and Holden.
Mode of supply: Gravity.
Capacity of reservoirs, 2,549,827,789 gallons.
Average pressure: High service, 150 pounds; low service, 70 pounds.
Number of miles main pipe, 2 inches to 40 inches diameter, 192.931.
Number of miles service pipe, 134.774.
Number of fire hydrants, 1980.
Number of water gates, 2821.
Number of water meters, 14,083.
Total cost of works to date, Dec. 1, 1905, $4,325,986.78.
Thirty-four fire hydrants have been set during the year.
The total number now in service for fire protection is 1980.
Of this number 203 are on the premises of individuals and corporations.
Number of water cart hydrants in use, 123.
Number of car-sprinkling hydrants in use, 41.
Number of drinking fountains in use, 9.
Number of watering troughs in use, 18.

Elevation of Reservoirs Above Main Street at City Hall.

Kettle Brook Reservoir No. 1.

Rollway, 364.36 feet.

Kettle Brook Reservoir No. 2.

Rollway, 507.5 feet.

KETTLE BROOK RESERVOIR NO. 3.

Rollway, 559.00 feet.

KETTLE BROOK RESERVOIR NO. 4.

Rollway, 601.74 feet.

LYNDE BROOK RESERVOIR.

Rollway, 341.94 feet.

PARSONS RESERVOIR.

Rollway, 237.80 feet.

HOLDEN STORAGE RESERVOIR NO. 1.

Rollway, 269.88 feet.

HOLDEN RESERVOIR NO. 2.

Rollway, 237.80 feet.

HOLDEN DISTRIBUTING RESERVOIR.

Rollway, 177.00 feet.

Elevation of Main Street at City Hall above tide water, 481 feet.

Water pressure at City Hall, low service, 70 pounds.

Water pressure at City Hall, high service, 150 pounds.

In addition to the service pipes, which are reported in tabulated form, there have been sixty-four changed, for which 766 feet of pipe was used in the streets, and 2408 feet on the premises of the owners.

Three thousand, two hundred and seventy-two (3272) feet of temporary mains have been laid, the persons thus supplied paying the expense of trenching and laying, and for pipe exceeding 100 feet.

The following tables will show rainfall at the reservoirs, sizes of pipe laid, also number of gates and hydrants set during the year.

TABLE

Showing the daily height of water in KETTLE BROOK No. 2 RESERVOIR and the rainfall for year ending November 30, 1905.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1							...						21.30		21.34		21.09		19.50				14.20	
2					...								21.30		21.34		20.76		19.35				14.20	
3											...		21.30		21.34		19.92		19.42				14.20	
4				...									21.22		21.34		19.34		20.15				14.22	
5												...	21.22		21.29		18.68		20.68				14.25	
6													21.22		21.29		18.05		20.70				14.30	
7													21.28		21.25		17.92		20.58				14.38	
8								...					21.34		21.25		17.92		20.40		3.85		14.40	
9													21.34		21.25		18.67		20.20		5.20		14.40	
10													21.34		21.25		18.21		20.00		6.80		14.42	
11													21.32		21.25		17.51		19.80		7.95		14.43	
12													21.34		21.21		18.00		19.67		9.05		14.44	
13													21.42		21.17		17.83		19.85		10.10		14.45	
14							...						21.42		21.17		17.76		19.88		10.95		14.45	
15				...				...					21.42		21.17		17.67		19.90		11.80		14.45	
16					...								21.38		21.17		17.67		19.00		12.50		14.47	
17												.. .	21.34		21.17		17.67		18.00		13.20		14.50	
18									...		...		21.24		21.21		18.00		17.00		14.00		14.25	
19		.. .											21.38		21.17		18.51		15.60		14.05		14.00	
20													21.38		21.00		18.67		15.00		14.08		13.65	
21				...									21.38		20.34		18.67		13.70		14.20		13.35	
22													21.46		19.59		18.76		11.30		14.20		13.10	
23													21.55		18.67		18.84		10.50		14 20		13.10	
24													21.42		17.88		19.67		8.50		14.20		12.70	
25													21.42		16.76		19.76		7.35		14.20		12.55	
26													21.42		16.34		19.76		5.38		14.20		12.40	
27													21.42		17.08		20.00				14.20		12.25	
28													21.34		18.05		20.25				14.20		12.37	
29													21.34		19.34		20.25				14.20		12.73	
30													21.34		20.55		20.09				14.20		12.80	
31															21.00		19.92				14.20			
Totals.																								

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 21.34 feet.

TABLE

Showing the daily height of water in KETTLE BROOK NO. 3 RESERVOIR and the rainfall for year ending November 30, 1905.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1													26.00		26.00		26.04		25.78		25.94		18.55	
2													26.00		26.00		26.04		25.78		25.95		18.57	
3													26.00		26 00		26.04		26.00		25.95		18.59	
4													25.96		26.00		26.00		26 20		25.95		18.62	
5													25.94		25.95		26.00		26.15		25.95		18.67	
6													25.94		25.95		26.20		26.00		25.95		18.85	
7													26.00		25.91		26.20		26.00		25.80		19.00	
8													26.04		25.91		26.20		25.92		24.85		19.05	
9													26.04		25.91		26.24		25.90		23.83		19.05	
10													26.04		25.91		26.24		25.80		23.08		19.08	
11													26.02		25.91		26.20		25.70		22.45		19.10	
12													26.04		25.91		26.24		25.75		21.95		19.13	
13													26.08		25.91		26.24		25.88		21.40		19.20	
14													26.08		25.91		26.20		25.81		20.70		19.22	
15													26.04		25.91		26.20		25.83		19.95		19.25	
16													26.04		25.87		26.24		25.85		19.50		19.30	
17													26.04		25.87		26.24		25.85		18.77		19.40	
18													26.04		25.95		26.20		25.85		18.15		19.42	
19													26.04		25.95		26.20		25.85		18.20		19.44	
20													26.06		25.95		26.20		25.90		18 22		19.45	
21													26.06		25.95		26.20		26.00		18.40		19.45	
22													26.08		25.91		26.20		26.00		18.40		19.47	
23													26.17		25.87		25.71		26.00		18.45		19.10	
24													26.08		25.87		26.04		25.98		18.47		18 50	
25													26 04		25.87		26.04		25.97		18.50		18.30	
26													26 04		26.12		26.12		25.95		18.50		18.55	
27													26.04		26.33		26.12		25.90		18.50		18.80	
28													26.00		26.29		26.04		25 90		18.50		18.35	
29													26.00		26.29		25.95		25.92		18.50		18.30	
30													26.00		26.29		25.87		25.93		18.53		18.40	
31															26.04		25.87		25.94		18.53			
Totals																								

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 26.00 feet

TABLE

Showing the daily height of water in KETTLE BROOK NO. 4 RESERVOIR and the rainfall for year ending November 30, 1905.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1													22.44		23.58		22.11	.21	16.25	.21	18.56		18.98	.01
2													22.44		23.58		22.11	.07	16.30	.02	18.57	.04	19.00	
3				.34								.01	22.44		23.58	.22	22.11		16.70	3.77	18.60	.05	19.02	
4				1.39									22.40		23.58		22.10		17.30	1.57	18.60		19.10	.61
5		.07								.65		.01	22.40		23.56		22.10		17.82		18.60		19.11	.52
6		.06								.93			22.40	.51	23.56		21.91		17.93	.13	18.60		19.15	
7				.64		.55						.14	22.44	.12	23.54		21.67	.12	18.00		18.58		19.23	
8		.20		.21						.01			22.48	.63	23.54		21.37		18.03		18.57		19 25	.08
9		.14				.24		.41					22.48		23.53	.07	21.18	.47	18.05		18.57		19.25	
10								.35					22.52		23 53	.24	21.00	.24	18.07		18.57		19.28	
11										.90			22.52		23.53	.03	20.74		18.08		18.57		19.30	
12		.02		.74									22.52	.08	23.52		20.46	.06	18.17	.93	18.65		19.33	
13		.04				.41						.13	22.65	.97	23.51	.05	20.20		18.27	.01	18.67		19 35	
14												.18	22.69	.07	23.50	.08	19.90		18.35		18.67	.80	19.37	.01
15										.04		.16	22.69		23.51		19.62	.62	18.37		18 67		19.38	
16												.12	22 69		23.49		19.35	.17	18.38		18.70		19.40	.14
17												.03	22.69		23 48	.17	19.50		18.40		18.72		19.43	
18		1.25											22.69		23.48		18.70		18.40	.28	18.73		19.43	
19								.13					22.71		23.46	.73	18.40		18.43	.06	18 75		19.43	
20													22.73	.80	23.50		18.80		18.45	.31	18.80	.59	19.45	
21		.01				.03		3.02		.12			22.82	1.30	23.48		17.82	.01	18.52		18.88	.37	19 45	
22				.38						.43			23.07	1.02	23.46		17.60	.05	18.55		18.90		19.45	
23													23.32	.02	23.45	.04	17.35		18.55		18.92		19.45	
24										.01			23.36		23.43		17.50		18.55		18.94		19.45	
25								1.08					23 40		23.42		16.80	.53	18.55		18.95	.09	19.33	
26		.20		.55				.21					23.44	.22	23.28	.03	16.60		18.55		18.95		19.00	
27								.29				.11	23.48	.22	22.81		16.40	.05	18.55		18.95		18.60	
28		.52											23.48		22.57		16.22		18.55		18.95		18.27	
29				.15									23 48		22.25	.57	16.20	.06	18.55		18.95		18.13	1.35
30										.01		.10	23.48		22.09	.82	16.21		18.55		18.97		18.05	.28
31								.03							22.09	.15	16.25	.33			18.97			
	Totals	2.51		4.40		1.23		5.52		3.00		.99		5.96		3.20		2.99		7.29		1.94		3.00

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 27.74. Rainfall for year ending November 30, 1905, 42.03 inches.

TABLE

Showing the daily height of water in HOLDEN No. 1 RESERVOIR and the rainfall for the year ending November 30, 1905.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	20.93		17.32		20.39		19.03		29.20				29.65		29.26		27.41	.19	22.93	.14	22.94	.02	20.49	
2	20.73		17.33	.04	20.34		18.95		29.54				29.58	.02	29.23	.01	27.43	.04	22.76		22.83	.01	20.38	
3	20.57		17.37	.29	20.29		18.86		29.76		30.65				29.23	.17	27.36		22.86	4.05	22.73	.06	20.23	
4	20.36		17.39	.75	20.25		18.79		29.94		30.67		29.52		29.23		27.25		23.79	1.34	22.63		20.25	.62
5	29.19		17.43		20.22		18.72		30.11	.31	30.61		29.45		29 10		27.07		24.33		22.49		20.22	
6	19.96	.14	17.40	.20	20.20	.80	18.68		30.46	1.10	30.63	.03	29.37	.61	29.05		26.77		24.36	.13	22.53		20.10	.51
7	19.80		17.66	1.91	20.15	.16	18.59		30.43		...	.04	29.37		29.00		26.54	.05	24.46		22.42		20.19	
8	19.61	.04	18.93		20.11		18.52	.49	30.33		30.65		29.45	.49	28.92		26.18		24.37		22.33		20.13	.04
9	19.36		17.32		20.06	.24	18.62	.26	30.28		30.65	.11	29.37		28.89	.02	25.79	.23	24.37		22.23		20.10	
10	19.22		19.52		20.03	.23	18.76	.33	30.24				29.36		28.88	.18	25.51		24.30		22.11		20.08	
11	18.97		19.72		19.19		18.92		30.25	.76	30.58		29.32		28.83	.03	25.27	.12	24.22		21.99		19.99	
12	18.87		19.83	.75	19.98		19.00		30.29	.10	30.55	.08	29.26	1.03	28.78		25.12		24.19	.97	22.01	.60	19.98	
13	18.72	.53	20.12		19.97	.78	19.03		30.33		30.53	.06	29.37	.12	28.73	.05	25.15		24.36	.03	22.01		19.85	
14	18.66		20.31		19.91		19.02		30.28		30.48	.12	29.38	.03	28.69	.13	25.06		24.38		21.93		19.80	.03
15	18.56		20.40		19.84		18.98		30.30	.04	30.47	.15	29.30		28.62	.25	24.90	.61	24.31		21.84		19 67	
16	18.42		20.46		19.76		18.95		30.28		30.46	.04	29.29		28.57		24.78	.34	24.23	.03	21.80		19.60	.13
17	18.31		20.50		19.71		18.91		30.26		30.42	.07	29.20		28.48	.24	24.68		24.15	.01	21.71		19.54	
18	18.21	.42	20.52		19.65		18.90		30.20		30.39	.02	29.18		28.43		24.57		24.12	.07	21.62		19.48	
19	18.14		20.55		19.58		19.47	.20	30.12			.10	29 17	.92	28.36	.52	24.36		24.10	.18	21.58	.20	19.41	
20	18.00		20.53		19.54	.14	20.90	.04	30.15				29.06	.45	28.25		24.30		24.06	.34	21.57	.81	19.27	
21	17.93		20.53		19.49		21.34	.78	30.21	.44			29.09	1.17	28.18		24.17		24.13		21.52	.21	19.19	
22	17.81		20.56	.33	19.42	.02	21.68	.76	30.35	.15	30.21		29.35	1.02	28.11		24.11	.10	24.05		21.48		19.08	
23	17.75		20.58		19.37		21.84		30.52		30.12		29.59	.02	28.03	.04	23.98		24.00		21.41		18.99	
24	17.57		20.56		19.30		22.00		30.49		30.04		29.66		27.96	.02	23.82		23.87		21.28		18.83	
25	17.49		20 39		19.22		22.60	1.00	30.58		29.93		29.63		27.90		23.77	.51	23.77		21.18	.09	18.75	
26	17.43	.22	20.54	.69	19.19		23.88	.13	30.55		29.90		29.50	.19	27.83	.03	23 65		23.66		21.06		18.65	
27	17 35	.70	20.52		19.13		25.13	.25	30.56		29.83	.04	29.58	.10	27.75	.02	23.53	.11	23.46		21.03		18.62	
28	17.45	.55	20.50	.28	19.09		26.39		30.62		29.83		29.54		27.66		23.38		23.32		20.87		18.46	
29	17.47		20.48				27.33		30.66	.01	29.81		29.41		27.56	.39	23.25	.04	23.22		20.77		18.43	1.57
30	17.45		20.45				28.04		30.70		29.78	.15	29.33		27.53	.50	23.11	.03	23.08		20.73		18.75	
31	17.39		20.43				28.73	.04			29.70				27.50	.02	23.01	.29			20.60			
Totals.		2.60		5.24		2.37		4.28		2.91		1.01		6.17		2.62		2.66		7.29		2.00		2.90

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 30.10. Rainfall for year ending November 30, 1905, 42.05 inches.

TABLE

Showing the daily height of water in HOLDEN NO. 2 RESERVOIR and the rainfall for year ending November 30, 1905.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	31.12		33.68		34.56		33.65		37.68		39.13		38.40		37.29		34.61	.19	37.65	.14	37.68	.02	37.00	
2	31.30		33.70	.04	34.52		33.63		37.84		39.15		38.29	.02	37.18	.01	34.61	.04	37.63		37.78	.01	37.02	
3	31.45		33.76	.29	34.50		33.59		37.95		39.03		38.19		37.19	.17	34.46		37.83	4.05	37.82	.06	37.01	
4	31.70		33.84	.75	34.46		33.57		38.02		39.00		38.07		37.12		34.41		38.12	1.34	37.78		37.06	.62
5	31.95		33.88		34.41		33.55		38.13	.31	39.00		38.01		36.94		34.65		38.24		37.68		37.08	
6	32.15	.14	33.90	.20	34.37	.80	33.52		38.76	1.10	38.95	.03	37.91	.61	36.93		35.01		38.15	.13	37.61		37.08	.51
7	32.29		34.16	1.91	34.39	.16	33.50		39.13		38.92	.04	37.98		36.81		35.45	.05	38.18		37.56		37.13	
8	32.51	.04	34.55		34.38		33.48	.49	39.04		38.89		37.95	.49	36.68		35.96		38.13		37.49		37.14	.04
9	32.73		34.65		34.33	.24	33.62	.26	39.07		38.82	.11	37.88		36.58	.02	36.48	.23	38.03		37.48		37.15	
10	32.93		34.67		34.31	.23	33.71	.33	39.06		38.81		37.77		36.56	.18	37.13		37.92		37.42		37.13	
11	33.13		34.59		34.29		33.81		39.08	.76	38.67		37.67		36.49	.03	37.30	.12	37.88		37.33		37.02	
12	33.21		34.54	.75	34.25		33.85		39.07	.10	38.60	.08	37.61	1.03	36.33		37.27		37.95	.97	37.30	.60	36.93	
13	33.33	.53	34.65		34.24	.78	33.92		39.06		38.58	.06	37.70	.12	36.23	.05	37.26		37.96	.03	37.28		36.93	
14	33.25		34.61		34.23		33.92		39.01		38.57	.12	37.68	.03	36.15	.13	37.26		37.86		37.19		36.88	.03
15	33.23		34.56		34.18		33.95		38.98	.04	38.67	.15	37.57		36.03	.25	37.21	.61	37.76		37.10		36.87	
16	33.23		34.55		34.13		33.93		38.98		38.72	.04	37.50		35.93		37.37	.34	37.65	.03	37.06		36.88	.13
17	33.23		34.57		34.10		34.00		38.86		38.78	.07	37.33		35.85	.24	37.48		37.68	.01	37.01		36.88	
18	33.28	.42	34.56		34.08		34.04		39.28		38.76	.02	37.25		35.77		37.47		37.68	.07	36.93		36.88	
19	33.33		34.55		34.04		34.40	.20	39.35		38.75	.10	37.26	.92	35.62	.52	37.53		37.64	.18	36.87	.20	36.88	
20	33.31		34.58		33.98	.14	34.75	.04	39.38		38.78		37.28	.45	35.60		37.53		37.60	.34	36.97	.81	36.88	
21	33.29		34.63		33.95		34.85	.78	39.44	.44	38.72		37.31	1.17	35.46		37.59		37.58		37.03	.21	36.88	
22	33.27		34.60	.33	33.92	.02	35.05	.76	39.55	.15	38.73		37.46	1.02	35.33		37.55	.10	37.53		37.01		36.88	
23	33.27		34.60		33.89		35.12		39.58		38.75		37.62	.02	35.21	.04	37.56		37.47		37.00		36.87	
24	33.35		34.59		33.84		35.18		39.56		38.78		37.63		35.19	.02	37.55		37.48		37.03		36.86	
25	33.23		34.60		33.80		35.39	1.00	39.50		38.87		37.63		35.09		37.55	.51	37.54		37.04	.09	36.86	
26	33.33	.22	34.70	.69	33.76		35.92	.13	39.40		38.82		37.65	.19	35.00	.03	37.65		37.53		37.00		36.86	
27	33.45	.70	34.69		33.73		36.23	.25	39.34		38.73	.04	37.66	.10	34.84	.02	37.60	.11	37.53		36.98		36.86	
28	33.64	.55	34.69	.28	33.69		36.65		39.25	.01	38.70		37.66		34.72		37.63		37.59		36.98		36.86	
29	33.68		34.67				36.98		39.15		38.62		37.54		34.60	.39	37.64	.04	37.58		36.98		36.89	1.57
30	33.67		34.62				37.22		39.11		38.53	.15	37.40		34.60	.50	37.63	.03	37.65		36.98		37.05	
31	33.67		34.58				37.49	.04			38.51				34.61	.02	37.65	.29			36.98			
	Totals	2.60		5.24		2.37		4.28		2.91		1.01		6.17		2.62		2.66		7.29		2.00		2.90

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 38.76 feet. Rainfall for year ending November 30, 1905, 42.05 inches.

TABLE

Showing the daily height of water in LYNDE BROOK RESERVOIR and the rainfall for the year ending November 30, 1905.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	28.46		26.55		28.95		27.64		36.60		37.40		35.27		34.15		31.90	.21	33.70		33.42		30.35	
2	28.40		26.66		28.93		27.56		36.90		37.30		35.12		34.05		31.80		33.70		33.30		30.20	
3	28.32		26.92	.31	28.90		27.53		36.94		37.20		35.00		33.95	.23	31.86		33.80	3.81	33.25	.06	30.10	
4	28.26		27.05	1.16	28.76		27.50		36.94		37.05		34.88		33.88		31.95		34.80	1.62	33.18		30.05	.56
5	28.17		27.13		28.80		27.40		36.94	.19	37.00		34.74		33.78		31.91		35.25		33.07		30.05	
6	28.10	.15	27.16		28.75	.83	27.35		37.20	.30	37.05	.04	34.66	.56	33.65		32.02		35.36		32.90		30.00	.47
7	28.00		27.35	1.62	28.72		27.30		37.50		37.03	.03	34.55		33.53		32.15	.10	35.40	.02	32.82		30.00	
8	27.90		29.22		28.63	.06	27.24	.31	37.63	.01	36.96		34.55	.42	33.30		32.20		35.40		32.74		29.90	
9	27.78	.07	29.56		28.58	.27	27.40	.39	37.73		36.90	.16	34.45		33.18		32.25	.17	35.40		32.73		29.75	
10	27.69		29.68		28.55	.28	27.54	.36	37.80		36.82		34.38		33.00	.24	32.35		35.40		32.50		29.68	
11	27.52		29.70		28.50		27.88		37.88	.45	36.68		34.20		32.95		32.44	.16	35.42		32.36		29.58	
12	27.44		29.70	.12	28.50		28.05		38.09	.37	36.63	.05	34.15	.12	32.80		32.62	.07	35.40	.56	32.14	.57	29.55	
13	27.41	.56	29.91	.65	28.50	.55	28.07		38.11		36.55	.06	34.36	1.19	32.68	.15	32.80		35.49	.28	32.00		29.46	
14	27.32		30.00		28.36	.07	28.12		38.10		36.50	.17	34.36		32.57	.79	32.91		35.38		31.96		29.40	
15	27.21		30.00		28.36		28.15		38.06		36.44		34.30		32.50	.09	33.05		35.28		31.95		29.25	
16	27.10		30.00		28.40		28.08		38.00		36.40	.27	34.20		32.40		33.25	.94	35.24		31.88		29.14	
17	26.98		30.00		28.35		28.00		37.98		36.40	.05	34.05		32.33	.38	33.45		35.05		31.68		29.05	.13
18	26.92	.48	29.85		28.28		28.00		37.92		36.36	.02	33.90		32.28		33.58		35.00		31.50		29.00	
19	26.85		29.55		28.22		28.80	.09	37.85		36.34	.07	33.85	.82	32.20	.38	33.68		34.90	.09	31.40	.12	29.00	
20	26.68		29.33		28.12		30.27	.15	37.80		36.32		33.74	.13	32.20		33.73		34.85	.03	31.35	.95	28.90	
21	26.53	.04	29.20		28.08	.02	30.64		37.77	.61	36.25		33.74	.55	32.05		33.83		34.76	.28	31.38		28.90	
22	26.35		29.20	.31	28.00		30.94	1.22	37.80	.07	36.25		34.10	1.87	32.05		33.81	.05	34.70		31.38		28.90	
23	26.24		29.22		27.95		31.10		37.78		36.16		34.60		32.25	.02	33.82		34.60		31.30		28.86	
24	26.19		29.25		27.90		31.25		37.75		36.08		34.82		32.40		33.85		34.45		31.25		28.90	
25	26.19		29.37	.66	27.85		31.45	.97	37.70		35.95		34.82		32.46	.03	33.76	.56	34.30		31.14	.04	29.05	
26	26.22	.22	29.45	.79	27.84		32.75	.14	37.60		35.85		34.75	.06	32.53	.03	33.80		34.24		31.00		29.27	
27	26.11	.38	29.45		27.78		33.86	.24	37.54		35.70	.02	34.65	.08	32.46	.02	33.87	.12	34.00		30.95		29.38	
28	26.55	1.24	29.30		27.70		34.67		37.48		35.65		34.48		32.26		33.88		33.80		30.80		29.50	
29	26.62		29.23	.01			35.20		37.40		35.55		34.36		32.00		33.88	.02	33.65		30.76		29.75	.42
30	26.53		29.14				35.80		37.40		35.50	.10	34.25		32.00	.66	33.82		33.55		30.65		30.25	.79
31	26.55		29.02				36.30	.01			35.35				32.00	.01	33.78	.36			30.50			
Totals.		3.14		5.63		2.08		3.88		2.00		1.04		5.80		3.03		2.76		6.69		1.74		2.37

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 37.40 feet. Rainfall for the year ending November 30, 1905, 40.16 inches.

LENGTH AND SIZE OF NEW PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1905.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		Size in Inches	Length in Feet.			
Aberdeen	From end of pipe to Bedford avenue	8	233			High
Alvarado avenue	" end of pipe, northerly	8	110			Low
Ashmont avenue	" Quinsigamond avenue, easterly	8	300	1		Low
Avon avenue	" Grand View ave., southerly and easterly	6	1,541	3	4	High
Barber avenue South	" North avenue to Crerie avenue	12	427	2	2	High
Bedford avenue	" Aberdeen street, easterly	8	226	1	1	High
Belmont	" Plantation street, easterly	2	728			High
Bigelow	" Sigel to Ellsworth street	8	638		1	Low
Bond	" West Boylston street, northerly	16	760	3	1	High
Boyd	" Huntington avenue to Hastings avenue	8	585	1	1	High
Central avenue	" end of pipe, northerly	8	161	1	1	High
Clover	" South Ludlow street, easterly	8	208			High
Endicott	" Bigelow street to Quinsigamond avenue	8	610		1	Low
Grafton	" end of pipe, easterly	16	252			High
Henshaw	" Main street, easterly	8	755	2		Low
Hunt	" Shrewsbury street, southerly	6	255		1	Low
James	" Ludlow street, northerly	8	1,340	2	2	High
Lake avenue	" end of pipe, southerly	6	462	1		Low
Lawn	" Orient to Shale street	6	131			High
Marion avenue	" Shannon street, westerly	8	300	1	1	High
Marion avenue	" Providence street, easterly	8	230	1	1	High
Millbury avenue	" end of pipe, southerly	16	2,505	2	2	High
Monadnock road	" end of pipe, northerly	12	210	1		High
Norfolk	" end of pipe, easterly	10	1,100	2	2	High
Shale	" Lawn street, westerly	6	345	1		High
Shirley	" Florence street, easterly	6	215	1	1	Low
Shirley court	" Shirley street, southerly	6	192			Low
Union avenue	" Providence to Houghton street	16	1,875	2	4	High
Walcott avenue	" Vernon street, easterly	6	180		1	High
Willey avenue	" West Boylston street, westerly	8	616	2	2	High
Windham	" Vernon street, westerly	10	200		1	High
			17,690	30	30	

LENGTH AND SIZE OF PIPE RELAID DURING THE YEAR ENDING NOVEMBER 30, 1905.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		Size in Inches	Length in Feet.			
Batchelder	From Union avenue to Jefferson street	10	740	1	3	Low
Belmont	" Lincoln square, easterly	16	814		6	"
Hermon	" Main street to Beacon street	16	550		2	"
Jackson	" Main street to Beacon street	16	620	1	2	"
Lincoln	" Lincoln square, northerly	16	1,260		6	"
Pleasant	" Crown to West street	18	198		3	"
			4,182	2	22	

LOCATION, SIZE AND KIND OF HYDRANTS LOCATED DURING THE YEAR ENDING NOVEMBER 30, 1905.

STREET.	LOCATION.	KIND.	Size.	Size of Connection.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Ashmont avenue	On N. E. cor. Quinsigamond avenue and Ashmont avenue	Chapman	6	6	2½	2	8	80	Low
Avon avenue	On N. E. cor. Stafford street	Mathews	6	6	2¾	2	6	110	High
" "	13′ S. of S. line of house No. 31	"	6	6	2½	2	6	105	"
" "	3′ S. of house No. 9	"	6	6	2¾	2	6	100	"
Barber avenue South	4′ S. of North avenue	"	6	6	2⅞	2	12	99	"
" " "	194′ S. of North avenue	"	6	6	2¾	2	12	90	"
Batchelder	On S. line of house No. 7	Chapman	6	6	2½	2	10	28	Low
Bedford avenue	On S. W. cor. Columbus avenue and Bedford avenue	Philadelphia	6	6	2½	2	8	105	High
Bond	9′ 8″ W. of E. line of Plunger Elevator Co. shop	Florence	8	8	2½	2	16	105	"
"	15′ W. of W. line of Morgan's new shop	"	8	8	2½	2	16	105	"
"	26′ E. of E. line of Norton's new shop	"	8	8	2½	2	16	110	"
Boyd	On S. W. cor. of Boyd and Hastings avenue	Mathews	6	6	2⅞	2	8	85	"
Central avenue	57′ S. of N. line of new paper shop	"	6	6	2¾	2	8	90	"
Henshaw	5′ 6″ S. of S. line of house No. 3	"	6	6	2¾	2	8	38	Low
"	29′ S. of S. line of house No. 9	"	6	6	2¾	2	8	33	"
Jackson	14′ 6″ E. of E. line of block No. 1	"	8	8	2½	4	16	56	"
James	On N. E. cor. James and Hamburg streets	"	8	8	2½	2	8	115	High
"	On S. line of O'Neil's lot	"	8	8	2½	2	8	120	"
Lake avenue	38′ N. of S. line of C. E. Greene's house	"	6	6	2¾	2	6	105	Low
Marion avenue	On W. line of Crompton's lot	"	6	6	2½	2	8	60	High
" "	On E. line of lot No. 4	Chapman	6	6	2¼	2	8	70	"
Millbury avenue	6′ 6″ S. of S. line of house No. 93	Florence	8	8	2½	2	16	115	"
" "	10′ N. of N. line of house No. 155.	"	8	8	2½	2	16	115	"
Monadnock road	82′ S. of S. line of Shaw's house	Mathews	8	8	2½	2	12	92	"
Norfolk	8′ W. of W. line of house No. 28	"	6	6	2½	2	10	75	"
"	Opp. E. line of Clemence street	"	6	6	2½	2	10	80	"
Shale	On S. line of lot No. 9	Florence	6	6	2½	2	6	85	"
Shirley	On N. W. cor. Shirley and Horner streets	Chapman	6	6	2¼	2	6	50	Low
Union avenue	Opp. E. line of Chapin street	Florence	8	8	2½	2	16	85	High
" "	Opp. E. line of Plane street	"	8	8	2½	2	16	85	"
Willey avenue	22′ E. of E. line of house No. 6	Mathews	6	6	2½	2	8	110	"
" "	On E. line of front part of house No. 16	"	6	6	2½	2	8	100	"
	PRIVATE HYDRANTS.								
Belmont	Lakeside Construction Co.—on 6″ fire pipe	Mathews	6	6	2½	2	6	110	Low
Lincoln Park	Worcester Con. St. Ry. Co., 41′ 7″ W. of W. line of dance hall, 4′ S. of S. line of same	Chapman	6	6	2½	2	6	115	"

TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1905.

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1905,	12,526	98	76,679	250,333	212,402	22,818	180,305	14,331	120,671	2,519	29,520	30,028	25,113	6,134	15,743	189.238	1,946	2,769
Laid in 1905,	728			3,321	6,312	2,040	637		8,636	198						4.142	34	52
Total,	13,254	98	76,679	253,654	218,714	24,858	180,942	14,331	129,307	2,717	29,520	30,028	25,113	6,134	15,743	193.380		
Pipe taken up 1905,	250		30	125	1,833		133									.449		
Total feet,	13,004	98	76,649	253,529	216,881	24,858	180,809	14,331	129,307	2,717	29,520	30,028	25,113	6,134	15,743		1,980	2,821
Total miles,	2.462	.018	14.516	48.017	41.075	4.708	34.244	2.714	24.489	.514	5.59	5.687	4.756	1.161	2.98	192.931		

Service Pipes Laid to November 30, 1905.

	On the Street.		Premises of Individuals.		No.
	Feet.	Miles.	Feet.	Miles.	
Prior to 1887	171,603.36	32.498	188,386.48	35.676	7,629
1887	9,674.	1.832	11,418.25	2.162	469
1888	8,814.75	1.669	13,872.	2.627	431
1889	10,021.75	1.898	11,264.5	2.133	472
1890	9,300.58	1.761	13,972.9	2.644	449
1891	9,307.5	1.762	14,276.66	2.704	483
1892	10,012.58	1.896	12,803.25	2.424	506
1893	8,616.25	1.631	11,064.	2.095	430
1894	7,218.	1.367	11,035.	2.09	366
1895	7,469.	1.414	12,407.	2.35	366
1896	7,067.83	1.34	8,796.	1.66	346
1897	8,324.11	1.576	9,805.2	1.857	383
1898	7,291.	1.38	12,878.75	2.439	342
1899	7,234.25	1.37	12,134.	2.298	336
1900	6,047.25	1.126	8,241.5	1.56	284
1901	6,506.75	1.232	7,291.25	1.38	315
1902	4,604.	.872	7,255.	1.374	225
1903	6,027.	1.141	10,054.	1.904	297
1904	5,596.	1.059	8,529.5	1.615	284
1905	7,071.	1.339	8,549.	1.619	347
	317,806.96	60.163	394,034.24	74.611	14,760

WATER-CART HYDRANTS, 1905.

Ætna,	Near Coral St., 10′ 6″ out from stand pipe.
Austin,	24′ 6″ W. of W. line of Queen St., 11′ 6″ out from stand pipe.
Benefit,	59′ 7″ E. of E. line of Beacon St., 15′ 10″ S. of N. line of St., 26′ 6″ out from stand pipe.
Bloomingdale Rd.	104′ E. of E. line of Grafton St. (S.), 15′ 9″ N. of S. line of St., 22′ out from stand pipe.
"	7′ 8″ out from stand pipe.
Bowdoin,	13′ E. of E. line of Chestnut St., 5′ N. of stand pipe.
Bridge,	36′ 6″ W. of W. line of viaduct wall (S.), 20′ 4″ out from stand pipe.
Burncoat,	21′ E. of W. line of St., 18′ 9″ N. of N. line of Melville St.
Cambridge,	12′ 6″ S. of N. line of St., 3′ 6″ E. of W. line of Southbridge St.
"	16′ 9″ S. of N. line of St., 25′ E. of E. line of Douglas St.
"	11′ 6″ out from stand pipe.
" cor. Douglas,	15′ S. of N. line of St., 25′ E. of E. line of Douglas St.
Carroll,	7′ out from stand pipe.
Chandler,	43′ 6″ W. of W. line of Newbury St., 20′ 9″ out from stand pipe.
" near Park Ave.,	30′ W. of W. line of Park Ave., 7′ 3″ out from stand pipe.
" " Bellevue.	16′ E. of W. line of Wright's new machine shop, 24′ 8″ N. of stand pipe.
Chatham,	75′ 6″ E. of E. line of Houchin Ave., 12′ out from stand pipe.
Commercial,	20′ S. of N. line of Central St., 18′ E. of W. line of Commercial St.
Congress,	51′ 6″ W. of W. line of Crown St., 18′ out from stand pipe.
Crescent,	23′ 8″ out from stand pipe.
Crown,	4′ 4″ out from stand pipe.
Cutler,	6′ 3″ N. of N. line of Union Ave., 18′ 6″ out from stand pipe.
Eastern Ave.,	Near Belmont St., 19′ 10″ out from stand pipe.
E. Central, n. Ford,	26′ 2″ out from stand pipe.
Elm,	North side, about 100′ W. of Chestnut St., about 12′ E. of elm tree, 9′ 2″ out from stand pipe.
Florence,	8′ 7″ out from stand pipe
"	25′ N. of N. line of Charlotte St., 16′ E. of W. line of Florence St.
"	20′ 5″ S. of S. line of May St., 26′ 10″ out from stand pipe.
Foster,	12′ 8″ out from stand pipe.
Front,	63′ 7″ W. of W. line of Church St., 64′ N. of stand pipe.
Fruit, n. Dayton,	7′ out from stand pipe.
Garden,	54′ 3″ W. of W. line of Lincoln St., 19′ 6″ N. of S. line of Garden St., 23′ 9″ out from stand pipe.
Gold,	E. side, about 30′ S. of catch-basin, S. side of Bradley St., 20′ out from stand pipe.
Grand,	16′ 6″ E. of E. line of Illinois St., 26′ 6″ out from stand pipe, 5′ 9″ out from stand pipe.
" n. Douglas,	8′ 10″ out from stand pipe.
Green,	27′ 8″ N. of S. line of Crompton's shop, 14′ 4″ out from stand pipe.
Grove,	49′ S. of S. line of Lexington St., 34′ 3″ out from stand pipe.
"	End of wire mill, 7′ 9″ out from stand pipe.
"	Near North St., 8′ 6″ out from stand pipe.
Hermon,	14′ 4″ from S. line of barn wall on N. W. cor., Southbridge and Hermon Sts., 30′ 2″ W. of E. line of barn, 8′ 10″ S. of stand pipe.
"	9′ 6″ S. of N. line of Hermon St., 27′ E. of E. line of Main St.
Highland,	7′ 9″ out from stand pipe.
"	14′ W. of W. line of Boynton St., 10′ 3″ S. of stand pipe.
"	43′ E. of E. line of Westland St., 22′ 9″ out from stand pipe.
"	31′ 6″ out from stand pipe.
"	Near Newton Sq., 32′ 6″ out from stand pipe, 1′ 6″ E. of centre of stand pipe.
Hollywood,	S. of May St., 6′ 10″ out from stand pipe.
Home,	N. side, front of school-house lot, opp. end of Wesby St., 6′ 8″ out from stand pipe.
Hudson,	59′ 6″ S. of S. line of Elm St., 26′ out from stand pipe.
Institute Road,	Near Beechmont St., 3′ 4″ out from stand pipe.
" "	Near West St., 2′ 6″ out from stand pipe.
Jaques Ave.,	W. side, between two trees front of school-house lot, 8′ 6″ out from stand pipe,
King,	17′ W. of W. line of Queen St., 24′ out from stand pipe, ¾″ stop 17′ 9″ W. of W. line of Queen St., 22′ 3″ out from standpipe.
"	7′ 10″ out from stand pipe.
Lafayette,	13′ S. of N. line of St., 31′ W. of W. line Quinsigamond Ave., ¾″ stop 11′ 2″ S. of N. line of St., 32′ W. of W. line Quinsigamond Ave.
Lagrange,	50′ S. of S. line of Beacon St., 20′ out from stand pipe.
Lake,	19′ 9″ out from stand pipe.
Lancaster,	14′ S. of S. line of Institute Rd., 27′ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

Lincoln,	10′ 9″ N. of N. line of Perkins St., W. of Lincoln St., 14′ out from stand pipe.
Lodi,	4′ 3″ out from stand pipe.
Madison,	7′ 2″ W. of W. line of Southbridge St., 22′ 8″ out from stand pipe.
Main,	At Hammond St., 7′ W. of stand pipe.
"	22′ 9″ W. of E. line of Main St., 35′ N. of N. line of Gertrude Ave.
"	Near Grand St., 34′ N. of N. line of Downing St., 53′ E. of W. line of Main St., 3′ 6″ W. of stand pipe.
"	Opp. Marble St., 9′ 3″ out from stand pipe.
"	Near University Park, 9′ N. of stand pipe, 2′ 10″ out from stand pipe.
"	Near Park St., 25′ S. of stand pipe on branch of two-way hydrant, 1′ 8″ W. of E. line of curbstone.
"	11′ 7″ N. of N. line of Park St.
Mill,	13′ 6″ N. of N. line of Quinn's block, 27′ out from stand pipe.
Millbury,	Near the mill, 1′ 9″ W. of stand pipe, 2′ out from stand pipe.
"	Near Seymour St., 10′ W. of E. line of St., 13′ 9″ S. of N. line of Seymour St.
"	Near Greenwood St., 6′ N. of stand pipe.
"	Below the ledge, 2′ 6″ N. of stand pipe.
"	S. of Cambridge St., 13′ 3″ W. of E. line of St., 62′ 9″ N. of N. line of Whitney St.
Merrick,	107′ S. of S. line of Davis Ct., 7′ out from stand pipe.
Mulberry,	15′ E. of W. line of St., 27′ 3″ N. of N. line of Asylum St., 22′ 6″ out from stand pipe.
Newbury,	E. side, opp. division fence N. of Austin St., 6′ 9″ out from stand pipe.
Oak Ave.,	18′ 9″ E. of W. line of Ave., 26′ N. of N. line of Belmont St. (W).
Orange,	E. side, near Myrtle St., 6′ S. of electric light pole, 5′ 9″ out from stand pipe.
Orient,	3″ valve 21′ N. of N. line of Hamilton St., 18′ 8″ E. of W. line of Orient St., ¾″ stop 17′ 6″ E. of W. line of St., 22′ 3″ N. of N. line of Hamilton St.
Oxford,	15′ S. of S. line of Pleasant St., 8′ out from stand pipe.
Paine,	Near Perkins St., 8′ out from stand pipe.
"	Near Vinton St., 9′ 6″ out from stand pipe.
Park Ave.,	Box on Lovell St., 28′ 3″ S. of stand pipe, 12′ E. of W. line of Park Ave.
" "	7′ out from stand pipe.
" "	98′ 6″ N. of N. line of house 194 Park Ave., 18′ 10″ out from stand pipe.
Penn Ave.,	15′ 9″ E. of W. line of Ave., 20′ 4″ S. of S. line of Ave.
Piedmont,	33′ 6″N. of N. line of Brigham St., 22′ out from stand pipe.
Plantation,	13′ 8″N. of N. line of Shrewsbury St., 9′ 8″ W. of E. stone wall cor. Shrewsbury and Plantation Sts., 26′ 4″ N. W. from stand pipe.
Pond,	Cor. Harding St., 7′ 9″ out from stand pipe.
Prescott,	2′ 6″ out from stand pipe.
"	Above wire mill, 9′ 10″ out from stand pipe.
"	Near North St., 21′ out from stand pipe.
Richards,	8′ out from stand pipe.
Salisbury,	18′ 6″ W. of W. line of Dean St., 7′ out from stand pipe.
"	Cor. Park Ave. 8′ 10″ out from stand pipe.
Sheriden,	Box on Shrewsbury St., 27′ N. of S. line of St., 12′ E. of W. line of Sheridan St.
Shrewsbury,	12′ 3″ N. of S line of Shrewsbury St., 18′ W. of W. line of school-house fence.
Sigel,	66′ 6″ W. of W. line of Harding St.
Southbridge,	Near Prov. & W. R. R., 9′ 3″ out from stand pipe.
Southgate,	26′ 9″ W. of W. line of Southbridge St., 24′ 6″ out from stand pipe.
Sturgis,	S. side, opp. greenhouse, about 200′ from Lincoln St., 20′ 5″ out from stand pipe.
Summer,	17′ 3″ E. of W. line of St., 66′ 6″ S. of S. line of Central St.
Sycamore,	S. side in front of school-house lot, 16′ 6″ out from stand pipe.
Temple,	29′ 8″ S. of N. line of St., 22′ 10″ E. of W. line of Jourdan's barn.
Tufts,	W. side, near division fence, N. of No. 2, 7′ out from stand pipe.
Vernon,	21′ 9″ E. of E. line of Richland St., 10′ 6″ out from stand pipe.
Wall,	Near Norfolk St., 26′ out from stand pipe.
Ward,	3′ 6″ out from stand pipe.
"	19′ 6″ W. of W. line of Wade St., 17′ 6″ out from stand pipe.
Washington,	21′ 6″ N. of N. line Plymouth St., 15′ 10″ W. of E. line of Washington St., ¾″ stop 21′ 6″ N. of N. line Plymouth St., 17′ 6″ W. of E. line of Plymouth St., 19′ 3″ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

Water,	8′ 9″ out from stand pipe.
Waverley,	N. side, 6′ E. of third tree, W. of Coral St., 8′ 10″ out from stand pipe.
Westminster,	7′ 6″ out from stand pipe.
William,	7′ out from stand pipe.
"	7′ 3″ out from stand pipe.
Windsor,	N. of Harrington Ave., 19′ out from stand pipe.
Winslow,	15′ 9″ S. of S. line of Pleasant St., E. of Winslow St., 22′ out from stand pipe.
Winthrop,	Near Providence St., 6′ 3″ N. of stand pipe.
Woodland,	12′ 10″ N. of S. line of school-house lot, 6′ 10″ out from stand pipe.
"	Near Downing St., 2′ 8″ out from stand pipe.
Wyman,	22′ 9″ S. of S. line of Hollis St., 22′ 9″ out from stand pipe.

CAR-SPRINKLING HYDRANTS.

Belmont,	22′ 6″ S. of N. line of street, 36′ W. of W. line of Oak Ave.
Bloomingdale Rd.,	At cor. of Putnam Lane.
Boynton,	17′ 4″ E. of W. line of street, 30′ N. of N. line of Highland St.
Burncoat,	14′ 6″ E. of W. line of street, 94′ S. of S. line of engine house.
E. Worcester,	At Shrewsbury St., 8′ 3″ S. of S. line of Shrewsbury St., 14′ 4″ E. of W. line Norcross Bros.' office.
Franklin Sq.,	35′ W. of E. line of Main St., 14′ N. of S. line of Allen Ct.
Fremont,	21′ 6″ S. of N. line of street, 74′ E. of E. line of house No. 22.
Grafton,	22′ N. of S. line of street, 1′ E. of E. line of Houghton St.
"	51′ 4″ W. of E. line of Grafton St., 14′ S. of N. line of Keese St.
Grove,	12′ 10″ W. of E. line of street, 50′ 7″ S. of S. line of No. 328.
Highland,	12′ 4″ S. of N. line of street, 14′ W. of W. line of 162 Highland St.
June,	17′ W. of E. line of June St., 56′ N. of N. line of Chandler St. looking west.
Lincoln,	At house No. 160.
"	24′ W. of E. line of street, 14′ 2″ S. of N. line of Perkins St.
Main,	16′ 7″ W. of E. line of street, 11′ 3″ N. of N. line of Beaver St.
"	39′ 4″ N. of S. line of street, 88′ W. of W. line of McMullen lot 14.
"	20′ S. of N. line of Main St., 86′ 6″ E. of E. line of Lake St.
"	31′ N. of S. line of street, 5′ 6″ W. of W. line of ell part of house 1482 Main St.
"	19′ W. of E. line of street, 23′ S. of S. line of Hammond St.
Mill,	18′ W. of E. line of street, 31′ N. of N. line of Main St.
Millbury,	N. of Sigel St. 6″ gate on hydrant will shut this off.
"	26′ W. of E. line of street, 10′ N. of S. line of Maxwell St.
"	11′ 6″ W. of W. line of street, 15′ S. of N. line of Perry St.
Park Ave.,	21′ W. of E. line of Park Ave., 76′ S. of S. line of Fern St.
" "	23′ 8″ W. of E. line of Park Ave., 39′ N. of S. line of Harrington & Richardson's shop.
Pleasant,	15′ S. of N. line of street, 9′ 6″ E. of W. line of 137 Pleasant St.
"	19′ 6″ S. of N. line of street, 32′ 9″ W. of W. line of Park Ave.
"	20′ S. of N. line of street, 151′ W. of W. line of 414 Pleasant St.
"	3″ valve, 18′ W. of E. line of Pleasant St., 3′ 6″ S. of N. line of Wetherell's farm house.
Providence,	107′ S. of N. line of S. pier to Crompton's driveway, 20′ 3″ E. of W. line of Providence St.
Salem,	34′ 6″ S. of S. line of Front St., 26′ 6″ W. of E. line of Salem Sq.
Salisbury,	19′ W. of E. line of street, 23′ 8″ N. of N. line of Lincoln Sq.; this gate shuts to the right.
"	3″ valve, 36′ 6″ E. of E. line of Park Ave., 19′ S. of N. line of Salisbury St.
Shrewsbury,	115′ S. of N. line of Hunt St., 20′ W. of E. line of Shrewsbury St.
Southbridge,	426′ 6″ S. of N. line of Lafayette St., 17′ 6″ W. of E. line of Southbridge St.
Summer,	17′ E. of W. line of street, 29′ S. of S. line of Prospect St.
Vernon,	18′ 8″ W. of E. line of street, 24′ S. of S. line of Union Ave., looking west.
Washington Sq.,	43′ 6″ W. of W. line of Summer St., 40′ 8″ N. of S. line of Front St.
Webster,	3′ 8″ E. of E. line of street, 9′ 2″ N. of S. line of Jacques St.
W. Boylston,	Near Fair Grounds, 1′ S. of S. rail in centre of turn-out, near Fair Grounds.
" "	Near Huntington Ave., 16′ W. of E. line of W. Boylston St., 52′ S. of S. line of Huntington Ave.

DRINKING FOUNTAINS.

Cambridge Sq.,	On Millbury St., 30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
Franklin Sq.,	14′ 3″ E. of E. line of Scott's block, 20′ 3″ N. of N. line of same.
Front,	Cor. Salem Sq., 65′ 6″ from base of fountain, 42′ 9″ W. of W. line of Church St.
"	Cor. Summer on Summer St., 26′ E. of W. line of street, 8′ 8″ N. of N. line of Front St.
Lincoln Sq.,	Cor. Main St., shut off in sidewalk.
Millbury,	Cor. Reeves St, 1′ 6″ W. of W. line of Millbury St., 27′ 9″ S. of N. line of Reeves St.
Vernon Sq.,	22′ 4″ S. of N. line of Vernon St., 8′ S. of N. line of house, 108 Water St., 8′ E. of W. line of Water St.
Plantation cor. Belmont,	15′ E. of W. line of Plantation St., 6′ S. of S. line of Belmont St., 9′ 2″ out from drinking fountain.
Webster, Sq.,	30′ 9″ N. of S. line of Cambridge St., 25′ 6″ W. of W. line of Webster St.

WATERING TROUGHS.

Adams Sq.,	20′ W. of E. line of Lincoln St., on S. line of Shattuck St.
Belmont,	At Lake, 11′ 6″ S. of S. line of Belmont St., 34′ 7″ E. of W. line of Lake Ave.
Chadwick Sq.,	29′ S. of hydrant, 35′ 6″ E. from watering trough.
Chandler,	10′ 2″ E. of W. line of Bellevue St., 16′ 8″ S. of N. line of Chandler St., W.
"	31′ 6″ N. of S. line of Chandler St. 6′ 9″ E. of W. line of Mill St.
Coes Sq.,	11′ 4″ W. of E. line of street, 19′ N. of N. end of parapet wall, 42′ 10″ S. of S. line Coes shop, 56′ 8″ S. of S. line Beaver St.
Grafton,	Cor. Hamilton St., 16′ 5″ S of N. line of street, 32′ 6″ N. of trough 100′ 6″ W. of W. line of Orient St.
James,	14′ out from centre of trough, ½ rod stop, 11′ 9″ out from centre of trough.
Lincoln Sq.	43′ 8″ S. of N. line of Lincoln Sq., 10′ 3″ W. of W. line of Prescott St.
Millbury,	30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
"	At Greenwood St., 26′ 4″ directly E. from trough.
Pleasant,	7′ 3″ out from X on trough near the ground.
Southbridge,	33′ 2″ from W. line of Southbridge St., 28′ S. of S. line of Southgate St.
"	At Madison St., 32′ 9″ out from trough at Madison Sq., 36′ 6″ S. of S. line of 114.
"	At Stearns Sq., 6′ 3″ out from trough, 1′ 8″ S. from trough, drip 4′ S. of trough, 2′ 6″ W. of E. end of trough.
Vernon Sq.,	On Vernon St., 5′ 6″ above gate box, 6′ 9″ out in direct line from where it enters the trough.
Washington Sq.,	On Shrewsbury St., W. 36′ 6″ S. of N. line of St., 60′ E. of E. line of Summer St.
Webster Sq.,	15′ 9″ W. of W. line of Webster St., 30′ 10″ N. of S. line of Cambridge St.

EXPENDED 1905.

WATER WORKS CONSTRUCTION.

Salary of Commissioner Geo. W. Batchelder,	$2,091 66
Payrolls—laborers,	16,087 99
Clerical service,	1,151 60
Abatements,	5 28
Blank books, stationery and stamps,	5 35
Car tickets and transportation of laborers,	5 60
Carpentering and lumber,	73 35
Castings, patterns and fire clay,	2,084 97
Cordage, waste and packing,	9 25
Engineers' services and materials,	37 28
Express, freight and trucking,	685 67
Fuel,	28 81
Hack and horse hire,	76
Hardware, tools and repairs,	14 96
Hydrants, water gates, valves and repairs,	1,954 76
Inspection of pipe,	75 18
Iron pipe and freight on same,	10,038 77
Iron and steel,	16 71
Lead pipe and lead,	1,051 87
Meters and repairs,	5,603 31
Meters and repairs, Union Water Meter Co.,	3,513 14
Meters taken out,	174 50
Miscellaneous supplies and expenses,	27 27
New England Telephone and Telegraph Co., rental and service,	05
Pipe, fittings, etc.,	1,168 59
Powder and fuse,	146 88
Repairs, sewers,	189 46
Repairs, streets,	131 80
Sewer pipe, cement and sand,	22 54
Special castings for iron pipe,	862 26
Telegrams and telephone tolls,	1 60

Traveling expenses,	18 50	
Inspection of valves,	43 20	
Lead pipe connections,	4 15	
Guarding railroad track,	121 95	
		$47,449 02
Balance November 30, 1904,		$2,495 88
Transfers,	$17,500 00	
Revenue,	29,363 02	
		46,863 02
		$49,358 90
Expenditures,		47,449 02
Balance November 30, 1905,		$1,909 88

PIPE EXTENSION AND IMPROVEMENT ACCOUNT.

Pay rolls, laborers,	$5,630 24
Carpentering and lumber,	10 70
Castings, patterns and fire clay,	38 13
Cordage, waste and packing,	10 72
Engineers' services and materials,	1 17
Express, freight and trucking,	546 31
Fuel,	69 99
Hack and horse hire,	19
Hydrants, water gates, valves and repairs,	2,523 60
Iron pipe and freight on same,	15,963 55
Lead pipe and lead,	911 95
Legal expenses,	15 00
Powder and fuse,	49 63
Repairs, sewers,	73 20
Repairs, streets,	77 39
Sewer pipe, cement and sand,	17 18
Special castings for iron pipe,	105 40
Inspection of pipe,	155 10
Mary O'Malley, injury to person,	300 00

Inspection of hydrants and valves,	31 20	
Extra labor,	13 50	
Damage, street railway track,	17 34	
		$26,561 49
Balance November 30, 1904,		$12,361 79
Appropriation,	$14,200 00	
Revenue,	1 49	
		14,201 49
		$26,563 28
Expenditures,		26,561 49
Balance Nov. 30, 1905,		$1 79

KETTLE BROOK SUPPLY.

Pay rolls, laborers,	$5,109 94	
Blank books, stationery and stamps,	3 45	
Carpentering and lumber,	131 41	
Cordage, waste and packing,	11 25	
Engineers' services and materials,	1,002 95	
Express, freight and trucking,	12 27	
Fuel,	72 04	
Hack and horse hire,	20 50	
Hardware, tools and repairs,	29 04	
Iron and steel,	25 32	
Legal expenses,	3 90	
Miscellaneous supplies,	14 83	
Paints, oils and painting,	34 89	
Pipe, fittings, etc.,	12 34	
Railway supplies,	4 25	
Recording deeds,	90	
Rubber goods,	1 76	
Sewer pipe, cement and sand,	426 56	
Team work,	103 82	
Materials for gate house,	71 87	

Auctioneer's services,	28 61	
Insurance,	120 00	
Rent of barn,	26 00	
Austin E. Skiff, land,	60 00	
		$7,327 90
Balance November 30, 1904,		$5,483 70
Revenue,	$2,084 23	
		2,084 23
		$7,567 93
Expenditures,		7,327 90
Balance November 30, 1905,		$240 03

HOLDEN SUPPLY.

Cement,	$2 54	
Pay-rolls, laborers,	265 07	
Extra labor,	52 38	
Car tickets and transportation of laborers,	8 50	
Engineers' services and materials,	700 65	
Pay-rolls, team work,	58	
		$1,029 72
Balance November 30, 1904,		$409 76
Appropriation,	$800 00	
		800 00
		$1,209 76
Expenditures,		1,029 72
Balance November 30, 1905,		$180 04

ASNEBUMSKIT SUPPLY.

Engineers' services and materials,	$2,888 84	
Board of men and horses,	576 88	
Extra labor,	120 50	
Car fares,	95 50	
Fuel,	1 01	
Pipe and fittings,	38 05	
Hardware, tools and repairs,	21 31	
Miscellaneous supplies,	13 90	
Pay-rolls, laborers,	1,416 87	
Testing soil,	896 26	
Express, freight and trucking,	90	
Testing pump outfit,	94 05	
Pay-rolls, team work,	16 55	
Blacksmithing,	1 75	
Rubber goods,	13 04	
Record of waste water,	100 00	
		$6,295 41
Appropriation,	$50,000 00	
Revenue,	8 55	
		$50,008 55
Expenditures,		6,295 41
Balance November 30, 1905,		$43,713 14

Value of stock and tools on hand November 30, 1905, $136,-155.57. Bills have been rendered to the City Treasurer to the number of 2018, amounting to $30,874.54.

Number of abatements, twenty-five, amounting to $493.76.

Amount of bills in hands of Treasurer November 30, 1905, $7,099.28.

Amount collected during the year, $29,357.93.

Respectfully submitted,

GEORGE W. BATCHELDER,
Water Commissioner.

REPORT OF THE WATER REGISTRAR.

To the Honorable City Council of the City of Worcester.

Gentlemen: In compliance with section 7, chapter 48, of the City Ordinances, the report of the income division of the Water Department for the year ending November 30, 1905, is presented.

Three hundred and fifty-six (356) applications for water were received during the year and placed in the hands of the Water Commissioner.

The following bills were given the Treasurer for collection:

For metered water,	26,941 bills,	amounting to	$303,239 63
For annual rates,	539 bills,	amounting to	7,554 36
Total bills,	27,480	Total amount,	$310,793 99

Total amount of revenue received during the year ending November 30, 1905, $308,387.73. Of this amount $1,574.69 was from uncollected bills in the hands of the Treasurer November 30, 1904.

The amount of uncollected bills in the hands of the Treasurer November 30, 1905, was $3021. Of this amount $1480 was for bills against the Worcester Insane Hospital for water taken from unmetered connections in the grounds.

During the year the sum of $964.70 has been abated owing to changes from annual rates to metered rates, vacant tenements, and adjustment of bills of water takers. $738.19 was transferred.

Thirty-six services were shut off for non-payment of bills, and, with few exceptions, these bills have been paid and water turned on.

During the past year 3914 houses have been inspected and

2889 notices have been sent to owners notifying them of leaks in the water fixtures in their premises.

Financial Statement for the Year Ending November 30, 1905.

RECEIPTS.

For assessments for water, 1904,	$1,574 69	
For assessments for water, 1905,	306,813 04	
Accrued interest,	858 98	
Apples,	20 00	
Board of horse,	144 00	
Car fares,	1 00	
Fuel,	9 01	
Hay and grain,	361 25	
Horse hire and team work,	66 93	
Labor,	16 94	
Miscellaneous supplies,	80 94	
Refuse materials and junk,	31 56	
Rent of machinery,	3 25	
Rent of pasture,	25 00	
Transfer from liquor licenses, per order City Council,	4,000 00	
		$314,006 59

EXPENDITURES.

Amount transferred to interest on water loan,	$159,912 50	
Amount transferred to sinking fund, per order City Council,	1,950 00	
Running expenses,	86,761 52	
		248,624 02
		$65,382 57

Detailed Account of Expenditures.

Salary of Registrar George C. Hunt,	$1,600 00
Pay-rolls, laborers,	26,103 52
Clerical service,	1,977 33
Service of canvassers,	688 12
Service of meter readers,	5,490 86
Care of reservoirs,	2,064 00
Abatement of water rates,	12 00
Blacksmithing and blacksmiths' supplies,	328 91
Blank books, stationery and stamps,	459 27
Blankets, harness and repairs,	244 29
Books and subscriptions,	14 00
Car tickets and transportation of laborers,	425 50
Carpentering and lumber,	298 35
Carts, wagons and repairs,	554 95
Castings, patterns and fire clay,	1,237 79
Chemical analyses (water samples),	62 00
Cordage, waste and packing,	28 28
Engineers' services and materials,	461 21
Express, freight and trucking,	115 61
Fuel,	522 71
Furniture, fixtures and repairs,	33 97
Gas,	132 80
Gravel, filling and concrete work,	2 54
Hack and horse hire,	244 50
Hardware, tools and repairs,	909 43
Hay, grain and straw,	1,742 81
Horses,	450 00
Hose and couplings,	426 79
Hydrants, water gates, valves and repairs,	647 58
Ice,	24 93
Insurance,	40 00
Iron pipe and freight on same,	40 55
Iron and steel,	414 03
Lead pipe and lead,	141 20
Legal expenses,	1 16
Loam, fertilizer and seeds,	14 90

Medical attendance on horses,	36 00
Meters and repairs,	1,797 69
Meters and repairs (Union Water Meter Co.),	6,779 44
Miscellaneous supplies,	249 58
N. E. Telephone & Telegraph Co., rental and service,	74 67
Paints, oils and painting,	255 71
Pipe, fittings, etc.,	423 36
Printing and photographs,	327 17
Refreshments for committee and guests,	136 25
Refreshments for laborers,	25 75
Rent of machinery,	30 00
Rent of land for watering trough (B & A. R. R. Co.),	1 00
Rent of land, Woodward Street (M. J. Whittall),	300 00
Repair of buildings,	94 53
Repair of sewers,	3 71
Repairs at shop,	12 56
Repair of streets,	180 13
Rubber goods,	161 22
Sewer pipe, cement and sand,	144 90
Taxes in Holden,	195 98
Taxes in Leicester,	356 57
Taxes in Paxton,	159 35
Team work,	18 93
Traveling expenses,	14 68
Trees and planting,	174 39
Watering streets,	6 36
Rent of barn,	78 00
Repair of fountains,	13 67
Examination of water pipes,	18 93
George Wrightson, back pay on account of injury,	112 50
Amount transferred to Water Department (con.), per order City Council February 13, 1905,	15,000 00

Services of auctioneer,	23 16	
Boilers and repairs,	312 00	
Lead pipe connections,	1 28	
Heater,	95 00	
Engines, pumps and repairs,	505 81	
Pasturing horse,	2 50	
Tapping machine and fittings,	178 01	
Wire fence,	110 00	
Pay-rolls, laborers (Holden),	3,687 09	
Pay-rolls, team work (Holden),	950 27	
Pay-rolls, laborers (Lynde Brook),	45 78	
Pay rolls, team work (Lynde Brook),	1 86	
Pay-rolls, laborers (Kettle Brook),	5,574 37	
Pay rolls, team work (Kettle Brook),	135 47	
		$86,761 52

Revenue.

The total amount of revenue received from the collection of water rates during the financial year ending Nov. 30, 1905, was $308,387.73, the largest in the history of the department, and an increase of $14,593.71 over the preceding year.

	Revenue.	Increase.
1890	$140,293 71	
1891	148,332 04	$8,038 33
1892	164,638 19	16,306 15
1893	185,564 63	20,926 44
1894	185,940 02	375 39
1895	200,255 51	14,315 49
1896	207,295 65	7,040 14
1897	210,064 16	2,769 51
1898	222,006 33	11,942 17
1899	238,462 14	16,455 81
1900	262,175 74	23,713 60
1901	259,429 06	2,746 68
1902	269,428 64	9,999 58
1903	270,651 66	1,223 02
1904	293,794 02	23,142 36
1905	308,387 73	14,593 71

The quantity of water, in gallons, furnished and charged for during the year ending Nov. 30, 1905, was as follows:

Domestic purposes,	707,433,461	
Manufacturing purposes,	435,849,560	
Steam and electric railways,	237,105,474	
Elevators,	224,274,266	
Motors,	4,826,169	
Schools,	26,622,546	
Churches,	3,546,086	
Hotels,	18,088,389	
Hospitals,	62,222,614	
Stables,	8,112,127	
Laundries,	26,337,841	
Fire Department houses,	3,111,651	
Sewer Department,	4,248,383	
Street Department,	1,316,454	
Parks,	11,775,977	
Stores, offices, saloons, shops, etc.,	106,383,207	
Unmetered water (estimated),	30,000,000	
		1,911,254,205

The quantity of water in gallons furnished during the year for which no revenue is received, was as follows:

Street sprinkling,	104,989,200
Merrifield estate,	58,000,000
Hydrant flushing,	24,396,000
Urinals,	16,572,000
Watering troughs and drinking fountains,	43,683,000
Water Department, for testing meters, etc.,	3,220,000

Estimated water used in testing sprinkler systems,	1,200,000	
Miscellaneous purposes,	483,000	
		252,543,200
Total water accounted for,		2,163,797,405

DWELLINGS, PERSONS, FIXTURES, ETC., ASSESSED FOR WATER IN THE CITY OF WORCESTER.

Dwellings,	12,798	Baths,	19,488
Families,	27,347	Waterclosets,	35,491
Stores,	1,542	Hose,	10,683
Offices,	1,383	Boilers,	3,030
Saloons,	110	Horses,	5,261
Markets,	117	Cows or oxen,	892
Shops,	656	Elevators,	408
Stables,	2,342	Barber shops,	151
Persons using,	130,241	Hotels,	33
Sinks,	34,424	Schools,	78
Basins,	21,453	Motors,	45

The number of new meters set during the year was 449, making the total number now in use 14,083:

Kinds.	Sizes.										
	⅜″	¾″	1″	1½″	2″	3″	4″	6″	8″	10″	Total.
B. & F. Piston	446	41			5						492
Columbia....	1										1
Crown.....	8	2							...		10
Desper.....	227	9									236
Duplex.....	1										1
Empire.....	1			...							1
Gem.....	1		1		1	4	10	8		3	27
Hersey.....	733	44	3	1	2		1				784
" detector								2			2
" disc....	1434			1							1,435
Keystone.....	2										2
King.....	78										78
Lambert.....	20										20
Nash.....	87										87
Torrent.....			1		9	1	2	4			18
Trident.....	182	2									184
Union Rotary	9478	449	233	182	216	103	21	6	1		10,689
Worthington.	16										16
Total.....	12,715	547	238	184	233	108	34	20	1	3	14,083

During the year 161 Hersey, 232 Hersey disc, 5 King, 4 Lambert, 8 Nash, 7 B. & F. Piston, 2336 Union Rotary, 1 Torrent, 33 Trident and 1 Worthington meters have been taken off for repairs. Most of them have been repaired at the department shop without cost to the owner. Total cost of repairs, $9,614.32.

Table showing the yearly, daily and per capita consumption of water, in gallons, for the past ten years:

	Yearly Consumption.	Daily Consumption.	Per Capita Daily Consumption.
1896	2,241,980,567	6,125,630	60.9
1897	2,220,629,280	6,083,916	58.6
1898	2,480,385,988	6,795,578	64.1
1899	2,785,836,000	7,632,428	68.9
1900	2,975,716,025	8,152,373	72.
1901	3,290,031,620	9,013,785	77.6
1902	2,997,335,636	8,211,878	68.8
1903	3,535,818,440	9,687,173	79.2
1904	3,739,925,200	10,218,374	83.7
1905	3,517,396,800	9,636,703	76.

Water metered and accounted for during the past ten years:

	Total Metered.	Total Accounted For.	Per Cent. of Total Metered.	Per Cent. of Total Accounted For.
1896	1,140,774,775	1,208,376,055	50.8	53.9
1897	1,140,498,225	1,211,744,975	51.3	54.5
1898	1,246,347,086	1,306,696,336	50.2	52.6
1899	1,362,278,941	1,467,419,741	48.9	52.3
1900	1,489,290,945	1,614,622,045	50.4	54.2
1901	1,519,770,438	1,640,019,938	46.1	49.8
1902	1,580,824,913	1,700,922,413	52.7	56.7
1903	1,620,727,639	1,748,753,639	45.8	49.4
1904	1,758,092,526	1,883,290,526	47.	50.3
1905	1,881,254,205	2,163,797,405	53.4	61.5

Statistics of Consumption of Water.

1.	Total population (water census),	132,550
2.	Population on line of pipe (water census),	130,241
3.	Population supplied (water census),	130,241
4.	Total consumption for the year,	3,517,396,800
5.	Passed through meters,	1,881,254,205
6.	Percentage of consumption metered,	53.4
7.	Average daily consumption,	9,636,703
8.	Gallons per day to each inhabitant,	73
9.	Gallons per day to each consumer,	76
10.	Gallons per day to each tap,	354
11.	Cost of supplying water per million gallons, figured on total maintenance expenses,	$24 66
12.	Cost of supplying water per million gallons, figured on total maintenance plus interest on bonds,	$70 12

Remarks.

During the past year there has been a large increase in the amount of revenue received from the sale of water. Notwithstanding the unfavorable weather conditions during the summer, which necessitated the using of but very little water on the lawns, and the fact that one of the largest consumers stopped using city water, the revenue has increased $14,593.71 over the preceding year.

The total income for the fiscal year ending Nov. 30, 1905, was $308,387.73. This amount was the largest in the history of the department and was more than sufficient to pay the operating expenses, interest on water debt and the contribution to the sinking fund required by law. I think it is safe to say that the Water Department is now upon a self-sustaining basis, and there is every reason to believe that in the future the income from the sale of water will be sufficient to pay not only the fixed charges and operating expenses of the department, but will take care of any additional loans which it may be necessary to make for the purpose of developing the much needed water supply at Asnebumskit.

CONSUMPTION.

Strenuous efforts have been made the past year to reduce the consumption. You will observe from the table showing the consumption of water that the yearly use has fallen from 3,739,925,200 gallons in 1904, to 3,517,396,800 gallons in 1905; the daily use from 10,218,374 gallons in 1904 to 9,636,703 gallons in 1905, and the per capita daily use from 83.7 gallons in 1904, to 76 gallons in 1905. This is a record that I think cannot be equaled by any large city in the country. Cleveland, with a population of 425,000, less than four times the size of the city of Worcester, uses frequently 100,000,000 gallons daily, and Buffalo, with a population of 391,000, uses about 200,000,000 gallons daily. The excellent showing made by Worcester, as compared with other large cities, is largely attributed to the excellent meter system, more than 95 per cent. of the taps being covered by meters.

WATER ACCOUNTED FOR.

One of the greatest problems that confronts water companies, both public and private, is to account for water which enters the mains. During the past year efforts of the officials of the department have been exerted in this direction with very satisfactory results. 1,881,254,205 gallons, or 53.4 per cent. of the total consumption, has been metered and charged for, and 2,163,797,405 gallons, or 61.5 per cent. of the total consumption, has been accounted for. A large portion of the balance of 38.5 per cent. is accounted for as water used for fire purposes, leakages in the system and slow meters. In this connection, I desire to call your special attention to the large quantity of water accounted for, but for which no revenue is received by this department. During the past year 252,543,200 gallons of water have been furnished for different purposes free of charge. If the department had received pay for this water at the lowest rate provided by ordinance, it would have increased the revenue $25,254.32. In addition to this, there were in use during the year 1777 fire hydrants. Private water companies in other cities usually charge from $25 to $50 per hydrant per year, and in many

cities where the waterworks are owned by the municipality, a price nearly as large is paid. At the rate of $20 per hydrant per year, the department would have received $35,540. Add to this the $25,254.32 for water used and for which no revenue is received, and you have a total of $60,794.32, a sum sufficient to pay a dividend of 4 per cent. upon the total capitalization of both lighting companies in the city.

During the past season, under special order of the City Council, this department was obliged to furnish water free of charge to the American Car Sprinkler Co. for street sprinkling. According to the returns made by the Superintendent of Streets, 104,989,200 gallons of water were used for this purpose. If paid for at a rate of ten cents per thousand gallons, this department would have received $10,498. In my opinion, this water is not used for the general good, but is a luxury furnished to only a portion of the inhabitants. The total street mileage is 195 miles, and only 82 miles, or 42 per cent. of the total miles of streets, are watered. It seems to me unfair to tax the people living on the streets which are not watered for a luxury that they do not enjoy. I respectfully recommend that a committee from your honorable boards give this matter a thorough investigation before another contract is made.

In 1867 the city of Worcester condemned Mill Brook for sewer purposes. At that time Mr. Merrifield was using water from said brook for manufacturing purposes. In 1875, in consideration of a release from certain damages, the city of Worcester agreed to furnish Mr. Merrifield 200,000 gallons of water per day, and not to exceed 300,000 gallons in any one day. How much water has been furnished the Merrifield estate since this contract went into force, I am unable to state, but during the past year their total consumption has amounted to 58,000,000 gallons. Computed at the manufacturer's rate of ten cents per thousand gallons, it amounts to $5,800, which means a loss of income to the department since the contract went into effect of over $150,000. Whether this contract can be abrogated or not, I do not know, but it seems to be a matter that is worthy of your consideration.

CENSUS.

The annual water census shows the number of water takers to be 130,241, and the actual number of persons not using city water, 2,309, making the total population 132,550. The State census gives the population of Worcester as 128,135, a difference of 4,415. We feel that the water census is absolutely correct, as it was taken by two of the meter readers connected with the department, and a great deal of time and attention was given to the matter.

Respectfully submitted,

GEORGE C. HUNT,
Water Registrar.

REPORT OF CITY ENGINEER.

CITY ENGINEER'S OFFICE, Dec. 8, 1905.

To the Honorable City Council of the City of Worcester.

Gentlemen: I have the honor to submit the following report for the Engineering Department for the year ending November 30, 1905, as follows:

STREETS.

In accordance with orders of the City Council and preparatory to further action thereon, decrees have been prepared for the laying out and making public of streets, with a total length of 5.33 miles, and also decrees were prepared for the establishment of sidewalks on 18 streets, with a length of 2.84 miles. The following tables exhibit a list of the streets, together with other information pertaining thereto:

STREETS LOCATED FROM DECEMBER 1, 1904, TO DECEMBER 1, 1905.

Street	From	To	Width, Feet.	Length, Feet.	Date of Decree.	Remarks.
Ames	Vernon	Easterly	38	578.03	Nov. 27, '05	
Ashton	Washington ave.	Lincoln ave.	40	425.28	Nov. 27, '05	
Colton	Southbridge	D	40	945.15	Nov. 27, '05	
Columbus	Lovell	Circuit	40	612.70	Nov. 27, '05	
Dryden	Edgeworth	Hemans	40	524.90		
Elm Av.	Pleasant	Midland	50	299.88	Nov. 27, '05	
Forbes	Westminster	Windsor	40	392.77		
Gage	E. Shelby,	Elliott	40	554.26	Nov. 27, '05	
Grand View av.	Main	Stafford	40	1926.39		
Greenwood	Upland	City line	60	5097.18	July 10, '05	
Hemans	Dryden	Whittier	40	837.82		
Holland road	Main	Northerly	50	778.40	Nov. 27, '05	
Howe	Fruit	Sever	40	274.10	Nov. 27, '05	
Huntington av.	W. Boylston	Westerly	50	582.61		
Isabella	Englewood ave.	Circuit ave	40	588.90	Nov. 27, '05	
Litchfield	So. Crystal	Hacker	36 40	940.22	Nov. 27, '05	
Marie ave.	Burncoat	Westerly	60	1185.60		
May	Pleasant	Southerly	60	920.54		
Milton	Edgeworth	Millbrook	40 50	2091.08		
Norfolk	Wall	Ascension	45 50	1372.59		
Perkins	Paine	Windsor	40	1131.00		
Perry St. Ext.	Perry	N. Steele	40	921.66		
Shrewsbury	Adams	Belmont	100	2499.00	Oct. 2, '05	Relocation
Southgate	Grand	Litchfield	35 43	1328.07	Nov. 27, '05	
Vassar	Amherst	Cornell	60	484.00		
Windsor	Green Lane	Washington av.	40	884.12		
Total				28,126.25		

Gradient and sectional stakes were set for the construction and pavement of the following list of streets:

Street.	From	To	Length, Feet.	Remarks.
Alpine	Seymour	Vernon	859.93	
Bartlett	Front	Franklin	608.00	Block paving
Beechmont	Institute road	Salisbury	2665.90	
Cambridge	Kansas	Quinsigamond av.	671.5	Block paving
Chrome	Orient	Plantation	558.86	
Cornell	Richmond ave	Vassar	250.10	
Ellsworth	Quinsigamond av.	Easterly	133.90	Block paving
Englewood ave.	Lovell	Circuit av.	1566.41	
Harrison	Providence	Barclay	947.80	
Highland	Park ave.	Easterly	40.00	Brick paving
Lincoln	Lincoln sq.	Northerly	1221.60	Block paving
Main	Hawthorne	Hammond	1811.55	Bitulithic paving
North ave.	Barber ave.	Railroad	300.00	
Paine	Frederick	Norton	3377.00	
Park	Main	Salem sq.	735.10	Block paving
Pleasant	Chestnut	West	1305.00	Block paving, n. side
Salem	Myrtle	Madison	516.90	Concrete macadam
Southbridge	Main	Madison	878.15	Block paving
Webster	Bridge	No. Easterly	300.00	
Webster	Bridge	So. Westerly	435.00	
			19,182.70	

Decrees for the establishment of sidewalk grades, preparatory to further action by the City Council, were provided for the following named streets:

Street.	From	To	Date of Decree.	Length, Feet.	Side.
Alpine	Seymour	Vernon	July 10, '05	883.90	W. and S
Arlington	Jefferson	Union ave.	June 5, '05	655.20	East
Canterbury	South Crystal	Easterly		200.00	North
Caro	College	Boyden	July 10, '05	824.40	East
Dewey	Chandler	Tufts	May 22, '05	490.80	East
Douglas	Grand	Cambridge	June 19, '05	844.40	Southeast
Florence	May	Charlotte	Nov. 27, '05	1147.40	Southeast
Park ave.	Maywood	Oliver	June 5, '05	550.00	South
Richmond av.	Pleasant	Lull	June 5, '05	1800.00	East
Sever	Marston way	Highland	May 22, '05	835.40	East (reloc.)
Seymour	Millbury	Ward	June 19, '05	412.60	North
South Crystal	Canterbury	B. & A. R. R.		127.90	East
South Ward	Ward	Southerly	July 10, '05	588.00	West
Sturgis	Windsor	Uxbridge	July 10, '05	540.00	Both Sides
Union ave.	Chapin	Easterly	June 5, '05	600.00	South
Upsala	Vernon	Easterly		1100.00	North
Vernon	Harlem	Maxwell	July 10, '05	1116.20	West
Windsor	Green lane	Southerly	Nov. 6, '05	965.56	East
Windsor	Green lane	Mt. Vernon	Nov. 6, '05	1307.20	West
Total				14,988.96	

Upon petition, decrees were prepared for action by the City Council for the establishment of the grades on the following list of private streets:

Street	From	To	Length Feet.	
Caroline ave	Belmont	Southerly	893.0	
Chestnut ave	Pleasant	Northerly	1567.5	
Dustin	Belmont	Wigwam ave	975.0	
Frank	Belmont	Southerly	940.0	
Gates ave	Belmont	Southerly	730.0	
Norfolk	Ascension	Easterly	1064.8	
Oakwood Place	Belmont	Kendall	415 7	
Rena	Belmont	Wigwam ave	975.0	
Richland	Millbury	Ward	401.1	
Trowbridge circ't	Hope ave	Hope ave	1271.0	
Victoria ave	Tatman	Southerly	786.0	
Walnut ave	Pleasant	Northerly	638.0	
Wheeler ave	Forest	Westerly	800.0	
Total			11,457.1	

For the setting of curbstones, gradient and alignment stakes were placed on the following streets:

Street	From	To	Length, Feet.	Remarks.
Alpine	Seymour	Vernon	883.90	South and west sides.
Arlington	Jefferson	Union ave	655.20	East side
Ash	Green	Westerly	100.00	North side, reset
Bartlett	Front	Franklin	421.00	East side
Bartlett	Front	Franklin	100.00	East side, reset
Caro	Boyden	Northerly	584.60	East side
Charlton	Main	Beacon	1020.75	Both sides, reset
Chatham	High	Houchin ave	231.90	South side, reset
Chatham	Oxford	Crown	311.00	North side, reset
Dewey	Chandler	Tufts	490.80	East side
Douglas	Grand	Cambridge	844.40	East side
Elm	Main	Chestnut	633.30	North side
George	Main	Westerly	100.00	North side
Highland	Park ave	Easterly	49.30	South side
Lincoln	Forest ave	Northerly	200.00	East side
Orient	Grafton sq	Division	1175.00	West side
Paine	Norton	Mellville	456.47	Both sides
Park ave	Maywood	Oliver	549.80	South East side
Pleasant	Chestnut	West	1280.30	North side reset
Richmond ave	Pleasant	Lull	1500.00	East side
Salem	Madison	Myrtle	1033.80	Both sides, reset
Sever	Dayton	Howe	234.90	East side
Seymour	Millbury	Ward	414.30	North side
Shrewsbury	Belmont	Westerly	2200.00	Both sides
Sturgis	Windsor	Uxbridge	540.00	Both sides
Union ave	Chapin	Easterly	600.00	South side
Vernon	Harlem	Maxwell	1116.20	West side
Total			17,726.92	

Plans were provided for renumbering the following named streets, and notices were issued in accordance with the action of the City Council thereon:

Street	From	To	Length, Feet	Remarks
Alvarado ave.....	Belmont.....	Southerly.....	3375.30	
Bowdoin	No. Ashland	Harvard.....	1040.00	North side.....
Colton.....	Southbridge	D.....	945.15	
Total			5360.45	

The following is a summary of street work for various purposes:

	No. or Length in Feet.
Street bounds set,	56
Street bounds readjusted,	17
Line and grade given on application,	140
Locations examined and approved for electric light conduits,	44
Locations examined and approved for electric light poles,	285
Locations examined and approved for gas pipes,	26
Locations examined and approved for telephone conduits,	34
Locations examined and approved for water pipes,	10
Number of surveys for improvement of surface drainage,	3
Number of surveys of sidewalks to preserve trees,	2
Number of surveys to determine wall encroachments,	1
Number of surveys for book of plans,	2
Number of surveys for laying cross-walks,	4

Cross sections and estimates of the cost for the building of sidewalks, pavements and constructions were made on twenty-one streets, and numerous other measurements, together with

schedules of work accomplished, have been made as required by the Street Department.

Twenty-one plans of street locations were made and filed and duplicates furnished for recording.

The bridge on Webster Street over the Middle River, and also the one on June Street across Tatnuck Brook, were replaced during the season by masonry structures, both of which were built from the designs and under the direction and supervision of this department. Several other structures about the city that are too dilapidated for ordinary repairs, and some of which are insecure, should be replaced with permanent construction.

The bridge on Grove Street at Mill Brook, and the one on Burnett Street across Kettle Brook, should receive attention at an early date.

Sewers.

Plans, gradient and other assistance of an engineering nature, have been furnished the Sewer Department throughout the season as required, the total construction amounting to 3.835 miles, an itemized list of which will be found in the report of the superintendent.

Thirty-four plans were completed for sewerage purposes, together with the necessary plans for recording.

Four hundred forty-five sanitary and surface drains were inspected during the year, and gradients given therefor.

The draining and sanitation of Beaver Brook and surroundings have received attention, and a beginning has been made towards relief from the unhealthful conditions bordering upon this stream between the termini of Chandler Street and Coes Square. A location of 110 feet in width was laid out by action of the City Council, which is intended to provide sufficient space not only for the clear water channel of the brook, but for the eventful location of the main sanitary drain for the immediate and other territory lying northerly and westerly therefrom. The plans contemplate a reclaiming and improvement of this section, which upon maturity should make this hitherto undesirable locality an attractive one. Opportunity is here offered,

and without undue expense, by reason of its natural advantages for obtaining a feature of beauty that shall add materially to the appearance of the city in this direction, if it be treated in a befitting manner.

WATER.

In the absence of constructive features during the past season, the work of the department in this direction has been largely confined to further surveys and examinations of the proposed Asnebumskit supply. The field work is practically completed, and the plans for a first development are in an advanced stage. Studies for a proposed primary dam and basin in the vicinity of Pine Hill are being prepared, and it is hoped that a report may be made upon this work in the early part of the ensuing year.

By order of the City Council a report upon the complete development of the present sources of water supply was made, and to the recommendations therein contained I invite your attention.

The various reservoirs of the present system have been frequently visited by me, and are for the most part in a satisfactory state of maintenance. The spillway of the Lynde Brook reservoir is out of repair, and to which attention has been called in previous reports. A matter of such moment and consequence should not be allowed to drop into disregard, but should be given attention and maintained in a proper state of security and efficiency.

The many acres of swamp lands at the headquarters of Kettle Brook should be drained, and the system of ditching begun a year ago should be continued. The improved quality of the water is a vindication of the work already accomplished along this line.

The advantage of planting evergreen trees on the open spaces of land owned by the city on the Tatnuck and Kettle brooks particularly, would appear to warrant a small outlay in its beginning. Many acres that are now bare and of no special value excepting its control, could be profitably employed in this

manner, and in a few years would undoubtedly prove of inestimable value to the streams and catchment areas of the reservoirs.

A matter of considerable convenience to the Water Department, which I believe warrants your attention, is the construction and making passable of the way between the Parsons Brook and Lynde Brook reservoirs. The land is now owned by the city and marks the location of the conduit lying between these two reservoirs. The grading of a width of twelve feet, or sufficient to allow the passage of vehicles, would obviate the long detour and severe grades now made necessary by reason of the absence of the way suggested.

Your attention is invited to this desirable connection between two important points in the system of city reservoirs.

During the past year an improvement in the economy of water consumption is apparent, and attests the wisdom of placing meters on fire mains, and a restriction in the former general uses of water through hydrants and other means.

The following table shows the monthly and the average daily consumption of water, in gallons, for the fiscal year:

Months.	Consumption per Month.	Average Monthly Consumption.	Average Daily Consumption per Month.	Average Daily Consumption for the year.
December.....	299,790,920		9,670,675	
January.....	310,345,200		10,011,136	
February.. ...	275,174,240		9,827,651	
March.....	302,588,440		9,760,917	
April.....	281,690,920		9,389,697	
May.....	295,594,640		9,535,311	
June	289,640,560		9,654,685	
July.....	306,126,480		9,875,048	
August.....	297,247,720		9,588,636	
September....	290,575,560		9,685,852	
October.....	296,200,520		9,554,855	
November....	272,421,600		9,080,720	
		293,116,400		9,636,703

The maximum consumption of water for one day amounted to 11,294,800 gallons, and the average daily gallons per consumer for the year was 76 gallons.

MISCELLANEOUS.

The surveys of a miscellaneous nature are as scheduled below:

For Public Buildings:	
Surveys of estates, batters and levels,	6
For Law Department:	
Survey of property at Stafford Street,	1
For Health Department:	
Levels at Isolation Hospital,	1
For the Parks Commission:	
Establishment of boundaries, grades for roadway and ball grounds, and batters for Lincoln Memorial,	5

Measurements and additions to the plats of Hope Cemetery have been made, and other work prepared as requested by the superintendent.

For the Assessors' Department, excerpts of conveyances have been procured and platted. A partial book of plans has been completed, and additions thereto should be provided for the coming year.

The total number of plans made by the department for various purposes amounted to 100.

The several hearings relative to the abolition of grade crossings have called for the co-operation of this department. The additional plans required in the final adjustment of the street lines and grades, and the necessary data for construction purposes, are now being prepared.

To my assistants, for their faithful and efficient co-operation, my acknowledgment and appreciation therefor are justly due.

Respectfully submitted,

FRED'K A. McCLURE,
City Engineer.

ANNUAL REPORT

OF THE

WATER COMMISSIONER,

OF WATER WORKS, AND OF THE FIRE DISTRICTS

OF THE

CITY OF WORCESTER.



YEAR ENDING NOVEMBER 30, 1870.



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ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR, AND THE CITY ENGINEER

OF THE

CITY OF WORCESTER,

FOR THE

YEAR ENDING NOVEMBER 30, 1906

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1909

Report of Water Commissioner.

To the Honorable City Council of the City of Worcester.

GENTLEMEN:—In compliance with Section 4, Chapter 48, of the City Ordinances, the report of the Water Commissioner for the year ending Nov. 30, 1906, is respectfully presented.

CONSTRUCTION.

The work of laying main pipes has been carried on as usual by this department. Several important orders have been filled, which will greatly improve the fire protection, in some parts of the city.

Among such may be mentioned the 16" high service pipe on Grafton Street, from Union Square to Barclay Street; 16" low service on Belmont Street, from Fountain Street to Edward Street; 16" low service on Foster Street, from Commercial to Bridge Street, which is completed except for the crossing of the bridge at Union Street, and has been delayed pending the decision as to whether a new bridge shall be built when the street is paved.

The extension of the high service in Main Street, from the Worcester Market to the new Odd Fellows' Building, was a piece of work which required breaking through the granite block paving for several hundred feet.

By the use of live steam, forced against these blocks for several hours, the cement joints were softened so that many of the stones were removed without breaking and were again used in paving the street.

To any one familiar with the removal of granite blocks laid in cement the economy of the method used on this piece of work will be apparent.

Details of construction work for the past year are given in another part of this report.

CARE OF RESERVOIRS.

The usual attention has been given to the condition of the reservoirs.

The shores have been kept free from deposits of silt and vegetable growth, swamps have been ditched and every effort has been made to keep conditions in first-class shape.

Farms located on the water sheds have been inspected and the owners required to keep their surroundings clean.

In some cases drains have been put in to prevent wash from farm yards entering the water courses which supply our reservoirs.

SUPPLY.

The stored water has been of abundant quantity for the past year, owing to the distribution of a fair rain fall, and a reduced draft over the previous year.

The total draft for the year ending Nov. 30, 1905, was 3,517,396,800 gallons. Total draft for year ending Nov. 30, 1906, 3,363,564,740 gallons, a total reduction in 1906 of 153,832,060 gallons, or 421,457 gallons daily.

These figures are of especial importance when the fact is considered that Worcester of 1906, in population and business prosperity, was considerably greater than in 1905.

No better vindication of the Department's policy of metering fire pipes need be made than an examination of these figures showing the results for the second year of the practice.

RECOMMENDATIONS.

That work started on Asnebumskit headworks and canal during 1906 be continued until water supply from that source will be promptly available, in case of need.

That pipe improvement be continued at a rate not less than the expenditure of $25,000 yearly.

That new headquarters be established for this Department.

The present building, on Bigelow Court, is totally inadequate for the purposes required. It is not adapted for water department uses, and is unsafe for occupancy.

The Department has at present three places where its shop work is done or material stored. Cambridge Street, at Woodward Street, where main pipe is stored on land leased at a cost of $300 per annum.

East Worcester Street, a small yard where fittings are stored, but not large enough for general headquarters, and the present unsuitable building on Bigelow Court.

It is earnestly urged and recommended that a suitable site be purchased, where a good department building can be erected and a pipe yard established. No money need be taken from the tax levy for this or any other purpose, during the coming year, as the revenue will be sufficient for all purposes.

FINANCES.

The financial condition of the Department is highly satisfactory.

With a reduced draft of water in 1906 over 1905, the revenue is largely increased, showing conclusively that the Department is now getting paid for a larger portion of its product.

Large expenditures will be necessary to enlarge the plant sufficiently to keep pace with the growth of Worcester, but they can undoubtedly be taken care of by the revenue received from the sale of water.

CONCLUSION.

I wish to acknowledge the assistance of the Water Committee, during the past year, and the co-operation of the Engineering Department, also the hearty support rendered me by the foremen and employees of the Water Department.

SUMMARY OF STATISTICS.

Dates of construction: 1845, 1864, 1883, 1895, 1896, 1900, 1901, 1902, 1903, 1904, 1906.

Source of supply: Impounding reservoirs in the towns of Leicester, Paxton and Holden.

Mode of supply: Gravity.

Capacity of reservoirs: 2,549,827,789 gallons.

Average pressure: High service, 150 pounds. Low service, 70 pounds.

Number of miles main pipe, 2 inches to 40 inches diameter, 197.22.

Number of miles service pipe, 137.983.

Number of fire hydrants, 2,012.

Number of water gates, 2,868.

Number of water meters, 14,466.

Total cost of works to date, Dec. 1, 1906, $4,406,201.86.

Thirty-two fire hydrants have been set during the year.

The total number now in service for fire protection is 2,012.

Of this number 205 are on the premises of individuals and corporations.

Number of water cart hydrants in use 125.

Number of car-sprinkling hydrants in use 41.

Number of drinking fountains in use 9.

Number of watering troughs in use 18.

ELEVATION OF RESERVOIRS ABOVE MAIN STREET AT CITY HALL.

KETTLE BROOK RESERVOIR No. 1.

Rollway, 364.36 feet.

KETTLE BROOK RESERVOIR No. 2.

Rollway, 507.5 feet.

KETTLE BROOK RESERVOIR No. 3.

Rollway, 559.00 feet.

KETTLE BROOK RESERVOIR No. 4.

Rollway, 601.74 feet.

LYNDE BROOK RESERVOIR.

Rollway, 341.94 feet.

PARSONS RESERVOIR.

Rollway, 237.80 feet.

HOLDEN STORAGE RESERVOIR No. 1.

Rollway, 269.88 feet.

HOLDEN RESERVOIR No. 2.

Rollway, 237.80 feet.

HOLDEN DISTRIBUTING RESERVOIR.

Rollway, 177.00 feet.

Elevation of Main Street at City Hall above tide water, 481 feet.
Water pressure at City Hall, low service, 70 pounds.
Water pressure at City Hall, high service, 150 pounds.

In addition to the service pipes, which are reported in tabulated form, there have been sixty-six changed, for which 854 feet of pipe was used in the streets, and 2,282 feet on the premises of the owners.

Three thousand, one hundred and forty-two (3,142) feet of temporary mains have been laid, the persons thus supplied paying the expense of trenching and laying, and for pipe exceeding 100 feet.

The following table will show rainfall at the reservoirs, sizes of pipe laid, also number of gates and hydrants set during the year.

TABLE

Showing the daily height of water in KETTLE BROOK No. 2 RESERVOIR for year ending November 30, 1906.

Date.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September	October.	November.
	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.
1	13.50	19.45	21.40	21.40	21.47	21.43	21.50	21.50	21.45	21.40	21.45	21.46
2	13.75	19.47	21.40	21.40	21.47	21.40	21.47	21.48	21.42	21.36	21.42	21.42
3	13.97	19.48	21.40	21.40	21.45	21.45	21.45	21.50	21.42	21.36	21.40	21.40
4	14.57	19.60	21.40	21.55	21.45	21.45	21.45	21.53	21.42	21.36	21.40	21.40
5	14.72	19.80	21.40	21.45	21.47	21.40	21.45	21.52	21.47	21.33	21.40	21.40
6	14.95	19.88	21.40	21.42	21.55	21.40	21.47	21.52	21.47	21.32	21.40	21.40
7	15.05	19.95	21.40	21.40	21.47	21.50	21.47	21.45	21.48	21.30	21.40	21.40
8	15.20	19.95	21.40	21.40	21.45	21.48	21.47	21.45	21.48	21.30	21.38	21.38
9	15.35	20.00	21.40	21.40	21.45	21.47	21.48	21.45	21.45	21.28	21.35	21.38
10	15.47	20.00	21.40	21.40	21.57	21.50	21.48	21.45	21.43	21.28	21.47	21.40
11	15.55	20.00	21.40	21.40	21.63	21.45	21.50	21.55	21.43	21.27	21.45	21.40
12	16.20	20.03	21.40	21.40	21.53	21.45	21.47	21.47	21.40	21.25	21.43	21.53
13	16.80	20.13	21.40	21.40	21.47	21.45	21.43	21.45	21.40	21.25	21.40	21.52
14	16.95	20.15	21.40	21.40	21.45	21.45	21.40	21.45	21.38	21.23	21.40	21.47
15	17.00	20.17	21.40	21.40	21.45	21.44	21.40	21.42	21.37	21.23	21.40	21.45
16	17.05	20.23	21.40	21.40	21.55	21.43	21.38	21.42	21.37	21.20	21.40	21.52
17	17.40	20.53	21.40	21.40	21.47	21.43	21.60	21.40	21.37	21.18	21.39	21.45
18	17.65	20.57	21.40	21.40	21.45	21.44	21.58	21.47	21.35	21.18	21.39	21.43
19	17.85	20.63	21.40	21.40	21.45	21.42	21.55	21.45	21.30	21.16	21.40	21.67
20	18.10	20.68	21.40	21.40	21.43	21.40	21.52	21.40	21.30	21.15	21.60	21.65
21	18.45	20.72	21.40	21.40	21.43	21.38	21.48	21.40	21.35	21.25	21.68	21.60
22	18.78	20.80	21.50	21.40	21.43	21.38	21.45	21.40	21.37	21.25	21.55	21.57
23	18.90	20.95	21.43	21.40	21.43	21.38	21.45	21.43	21.35	21.40	21.52	21.50
24	19.00	21.12	21.40	21.40	21.43	21.35	21.47	21.45	21.38	21.40	21.50	21.50
25	19.03	21.20	21.40	21.40	21.38	21.42	21.47	21.45	21.30	21.38	21.53	21.47
26	19.05	21.25	21.43	21.40	21.40	21.45	21.43	21.42	21.25	21.37	21.62	21.47
27	19.08	21.28	21.40	21.40	21.40	21.46	21.43	21.40	21.27	21.37	21.55	21.47
28	19.10	21.30	21.40	21.53	21.40	21.75	21.40	21.40	21.47	21.37	21.52	21.20
29	19.20	21.37		21.45	21.40	21.85	21.38	21.40	21.45	21.37	21.48	21.00
30	19.35	21.40		21.42	21.40	21.65	21.38	21.60	21.45	21.43	21.45	20.80
31	19 40	21.40		21.55		21.55		21.48	21.42		21.45	

The depth of water is shown in feet and decimals of a foot. Height of rollway 21.34 feet.

TABLE

Showing the daily height of water in KETTLE BROOK No. 3 RESERVOIR for year ending November 30, 1906.

Date.	December.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	November
	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.
1	18.27	15.85	19.90	22.15	26.10	26.05	26.10	26.10	26.05	26.02	26.02	26.04
2	17.78	15.95	20.00	22.20	26.10	26.05	26.10	26.08	26.03	25.98	26.00	26.02
3	17.50	16.00	20.05	22.22	26.07	26.07	26.10	26.10	26.02	25.98	26.00	26.00
4	17.83	16.20	20.10	22.90	26.07	26.05	26.08	26.13	26.02	25.98	26.00	26.00
5	17.57	16.60	20.15	23.32	26.10	26.05	26.05	26.13	26.08	25.95	26.00	26.00
6	17.30	16.75	20.18	23.50	26.20	26.05	26.08	26.13	26.08	25.94	26.00	26.00
7	17.07	16.85	20.20	23.60	26.13	26.12	26.08	26.08	26.09	25.94	26.00	26.00
8	16.77	16.92	20.23	23.67	26.10	26.10	26.08	26.08	26.09	25.94	25.98	25.98
9	16.55	17.00	20.25	23.73	26.10	26.10	26.09	26.08	26.08	25.93	25.96	25.98
10	16.20	17.05	20.30	23.85	26.10	26.12	26.09	26.07	26.05	25.93	26.05	26.00
11	16.00	17.08	20.32	23.90	26.23	26.08	26.10	26.10	26.03	25.92	26.03	26.00
12	15.43	17.13	20.35	24.00	26.15	26.07	26.07	26.07	26.03	25.91	26.00	26.12
13	15.20	17.30	20.38	24.10	26.13	26.07	26.03	26.05	26.02	25.91	26.00	26.10
14	14.80	17.35	20.40	24.15	26.10	26.07	26.02	26.05	26.00	25.91	26.00	26.07
15	14.55	17.45	20.43	24.20	26.10	26.07	26.00	26.03	26.00	25.90	26.00	26.05
16	14.23	17.50	20.45	24.33	26.15	26.05	26.00	26.03	26.00	25.88	26.00	26.15
17	13.80	17.95	20.45	24.37	26.10	26.05	26.22	26.01	26.00	25.87	25.98	26.05
18	13.50	18.02	20.47	24.40	26.10	26.05	26.18	26.07	25.98	25.87	25.98	26.03
19	13.20	18.19	20.50	24.45	26.08	26.05	26.15	26.03	25.95	25.86	26.00	26.23
20	12.85	18.27	20.55	24.55	26.05	26.03	26.13	26.01	25.95	25.86	26.00	26.20
21	12.38	18.38	20.57	24.65	26.05	26.00	26.12	26.01	26.00	25.98	26.27	26.15
22	13.75	18.60	21.05	24.70	26.05	26.00	26.10	26.01	26.02	25.98	26.15	26.12
23	14.25	18.85	21.20	24.75	26.05	26.00	26.10	26.03	26.05	26.00	26.10	26.07
24	14.60	19.22	21.45	24.75	26.05	26.00	26.10	26.05	26.08	26.00	26.09	26.07
25	14.75	19.42	21.55	24.77	26.03	26.04	26.10	26.05	26.08	25.97	26.10	26.05
26	14.85	19.57	21.85	24.80	26.05	26.06	26.05	26.02	26.05	25.95	26.20	26.05
27	14.95	19.60	22.05	24.95	26.05	26.07	26.05	26.00	26.05	25.95	26.13	26.05
28	15.00	19.65	22.10	25.35	26.05	26.32	26.02	26.00	26.12	25.95	26.10	26.00
29	15.20	19.70		25.65	26.05	26.45	26.00	26.00	26.08	25.95	26.06	26.00
30	15.48	19.75		25.90	26.05	26.25	26.00	26.20	26.08	26.03	26.03	26.00
1	15.68	19.85		26.10		26.15		26.08	26.04		26.03	

The depth of water is shown in feet and decimals of a foot. Height of rollway 26.00 6eet.

TABLE

Showing the daily height of water in KETTLE BROOK No. 4 RESERVOIR and the rainfall for year ending November 30, 1906.

Date.	December		January.		Febuary.		March.		April.		May.		June.		July.		August.		Sept.		October.		November	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	17.85		16.75		19.37		21.10		24.63		27.70		27.85		27.52	1.47	27.75	.01	27.74		27.65		27.77	
2	17.67		16.80		19.40		21.10		24.75		27.72		27.83		27.52	.28	27.75		27.70		27.64		27.75	
3	17.45		16.85		19.40		21.12		24.83		27.75	.17	27.80	.22	27.55	.22	27.75		27.70	.20	27.63		27.73	
4	17.65	1.66	16.97	.63	19.40		21.63	.41	24.92		27.75		27.78		27.62	.78	27.75	.35	27.70		27.63		27.73	
5	17.50		17.20		19.42		22.00		25.03	.12	27.77		27.77		27.50		27.82	.65	27.67		27.63		27.73	
6	17.27		17.30	.05	19.45		22.10		25.23		27.77	.14	27.80	.35	27.37		27.82	.22	27.65		27.63	.15	27.73	
7	16.75		17.35		19.45		22.17		25.33	.05	27.85	.57	27.80		27.42		27.82		27.63		27.63		27.73	
8	16.78		17.37	.11	19.47		22.25		25.40		27.83	.01	27.80	.21	27.40		27.82	.38	27.62		27.62		27.72	
9	16.60		17.40		19.47	.87	22.30	.05	25.47		27.83	.21	27.81	.30	27.37		27.80	.03	27.62		27.62	.01	27.71	
10	16.42	.75	17.40		19.55		22.35		25.70	.95	27.85	.01	27.82	.06	27.35	.06	27.77		27.62		27.75	.22	27.73	
11	16.17		17.40		19.57		22.40		26.18		27.83		27.88	.36	27.45	.29	27.77		27.61		27.75	.02	27.73	1.12
12	16.08	.01	17.50	.26	19.58		22.48	.20	26.43		27.80	.23	27.80		27.42		27.76		27.60		27.75		27.83	.11
13	16.00		17.58		19.60		22.52		26.53		27.80		27.77		27.40		27.74		27.60		27.75		27.82	
14	15.90		17.60	.26	19.65		22.57		26.63	.34	27.80	.14	27.76		27.37		27.73		27.58		27.74		27.80	
15	15.83		17.70		19.67		22.60		26.73	.77	27.80		27.75		27.35		27.73		27.56		27.74		27.78	
16	15.70		17.75	.65	19.67	1.01	22.77	.83	27.00		27.80		27.73		27.33	.01	27.72		27.54		27.74		27.82	.82
17	15.60		18.05		19.68		22.78		27.12		27.80	.09	27.85	1.70	27.33	1.02	27.70		27.52		27.73		27.80	
18	15.45		18.15		19.68		22.80		27.20		27.80	.07	27.82	.04	27.43		27.68		27.51		27.73		27.78	
19	15.38		18.22	.18	19.70		22.83	1.05	27.25		27.80		27.75	.05	27.43		27.65		27.50		27.73		27.95	.12
20	15.30		18.27	.06	19.72		22.92		27.30		27.80		27.70		27.43	.03	27.65	.13	27.49	.45	27.74	2.30	27.95	
21	15.25	1.24	18.35		19.75	.38	22.97		27.37		27.75		27.62		27.43		27.70		27.58	.29	27.96	.07	27.90	.13
22	15.73		18.50		20.22	.49	23.00		27.43	.11	27.73		27.62		27.45	.80	27.72	.96	27.58	.78	27.87		27.85	
23	15.95	.16	18.65	.05	20.45		23.02		27.45	.24	27.73		27.58	.05	27.55	.21	27.80	1.05	27.63	.18	27.84		27.83	
24	16.10		18.93	.19	20.58		23.03		27.53		27.72	.29	27.55	.11	27.57		27.82	.47	27.65		27.82		27.80	
25	16.18		19.03		20.62		23.05		27.55		27.75	.24	27.45	.02	27.54	.05	27.82		27.63		27.85	.75	27.79	
26	16.23		19.08		20.87	.56	23.07		27.58		27.77	.17	27.44		27.54		27.80		27.62		27.90		27.79	
27	16.25		19.13		21.00		23.13	.36	27.60		27.78	.59	27.42		27.54	.05	27.77		27.60	.15	27.85		27.79	.09
28	16.33		19.17		21.05		23.73		27.63		27.97	3.52	27.42		27.53		27.82		27.60		27.82		27.77	.06
29	16.40	.60	19.23				24.10		27.65		28.10	.62	27.40		27.53	.08	27.80	1.05	27.60		27.78		27.74	
30	16.60	.03	19.27				24.30	.28	27.68	.12	27.96		27.40		27.70	1.45	27.80		27.65	.78	27.76		27.85	
31	16.73		19.30	.04			24.50				27.85				27.75	.01	27.77				27.76	.13		
Totals.		4.45		2.48		3.31		3.18		2.70		7.07		3.47		6.81		5.29		2.78		3.65		2.45

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 27.74. Rainfall for year ending November 30, 1906, 47.64 inches.

TABLE

Showing the daily height of water in HOLDEN No. 1 RESERVOIR and the rainfall for year ending Nov. 30, 1906.

Date.	December		January.		February.		March.		April.		May.		June.		July.		August.		Sept.		October.		Nov.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	18.72		20.81		24.26		25.76		30.29		31.47		31.20		31.21	1.18	31.19		29.72		27.06		25.88	
2	18.75		20.89		24.32		25.76		30.24		31.35		31.29		31.16	.34	31.13		29.45		26.97		25.82	
3	18.74	1.36	20.95		24.34		25.76	.28	30.23		31.43	.17	31.43	.05	31.25	.13	31.11		29.35	.11	26.91		25.73	
4	19.15	.02	21.08	.94	24.31		26.46	1.74	30.23		31.33		31.37		31.36	.64	31.09	.22	29.20		26.74		25.68	
5	19.33		21.40		24.31		27.18		30.23	.17	31.35		31.40		31.44		31.11	.20	29.14		26.50		25.63	
6	19.24		21.56	.05	24.31		27.40		30.49	.38	31.33		31.41	.43	31.46		31.13	.15	28.98		26.49	.18		
7	19.22		21.68		24.31		27.59		30.70		31.28	.56	31.40		31.45		31.08		28.97				25.44	
8	19.23		21.76		24.26		27.75	.08	30.91		31.32		31.40	.22	31.43	.06	31.08	.26	28.83		26.21		25.36	
9	19.21		21.81	.08	24.20	1.11	27.85	.07	31.04		31.32	.20	31.39	.27	31.43		31.09		28.77		26.22		25.31	
10	19.25	.82	21.85		24.22		27.95		31.26	1.68	31.32	.04	31.37	.36	31.43	1.39	31.08		28.68		26.22	.71	25.30	.06
11	19'27		21.88		24.17		28.08		31.63		31.27		31.42		31.48		31.06	.02	28.58		26.17	.02	25.26	
12	19.30		21.92	.17	24.17		28.20		31.41		31.29		31.40		31.48		31.02	.01	28.48		26.09		25.36	1.24
13	19.23		21.99		24.12	.02	28.27	.27	31.23		31.31		31.33		31.39		30.99		28.40		25.97		25.37	
14	19.20		22.09	.33	24.08		28.36		31.32		31.27	.12	31.25		31.37		30.97		28.28	.02	25.88		25.38	
15	19.16		22.13		24.08	.52	28.43		31.36	.64	31.26		31.21		31.31				28.20		25.81		25.39	.62
16	19.12		22.19	.62	24.05		28.56	1.18	31.33		31.29		31.12	.05	31.26		30.83		28.08		25.73		25.44	.30
17	19.10		22.56		24.01		28.59		31.43		31.25	.21	31.43	2.02	31.23	.88	30.81		27.98		25.65		25.43	
18	19.09		22.70	.20	23.98		28.65		31.51		31.30	.04	31.53	.07	31.33	.05	30.77		27.85		25.60		25.71	
19	19.04		22.85		23.95		28.68		31.38		31.25		31.45	.04	31.27		30.74		27.78		25.52	.05	25.81	.02
20	18.99		22.93		23.93		28.87	1.23	31.36		31.18		31.50		31.23		30.71		27.70	.49	25.45	2.25	26.01	
21	19.01	1.03	22.99	.07	23.89	.11	28.91		31.42		31.15		31.48		31.18	.46	30.72	.78	27.55	.41	25.83	.05	26.15	.06
22	19.48		23.17		24.47	.59	28.99		31.37	.05	31.05		31.46		31.27		30.71	.04	27.58	.62	25.87		26.17	.08
23	19.86	.20	23.33	.02	24.83		29.03		31.36	.19	30.95		31.43	.08	31.21	.47	30.85		27.62	.14	25.91	.02		
24	19.95		23.59	.23	24.97		29.03				30.88	.44	31.42	.11	31.21	.15		.41	27.66		25.86		26.26	
25	20.05		23.78		25.08		29.08		31.33		30.95	.10	31.41	.02	31.21		30.75		27.48		25.88	.95	26.35	
26	20.11		23.89		25.33	.58	29.12		31.36		30.96	.13	31.33		31.15		30.56		27.39		25.99		26.40	
27	20.15		23.98		25.62		29.15	.21	31.36		30.95	.36	31.26		31.11	.02	30.50	.09	27.31	.14	26.09		26.46	.11
28	20.18		24.06	.05	25.73		29.67	.03	31.45		31.34	2.93	31.16		31.07	.23	30.41	.75	27.24		26.04		26.49	.10
29	20.33	.65	24.13				30.25		31.39		31.81	.58	31.06		31.08		30.34		27.10		26.04			
30	20.57		24.17				30.35	.21	31.40	.09	31.48		31.04		31.13	1.79	30.16		27.13	.83	25.83	.02	26.62	
31	20.73		24.23				30.36	.11			31.25				31.15		29.97				25.76	.12		
Totals.		4.08		2.76		2.93		5.41		3.20		5.88		3.72		7.79		2.93		2.76		4.37		2.59

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 30.10.
Rainfall for year ending November 30, 1906, 48.42 inches.



TABLE

Showing the daily height of water in LYNDE BROOK RESERVOIR and the rainfall for year ending Nov. 30, 1906.

Date.	December		January.		February.		March.		April.		May.		June.		July.		August.		Sept.		October.		Nov.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	30.60		34.38		35.00		35.06		38.38		37.45		38.20		37.40	1.44	37.66		35.25		31.40		31.08	.12
2	30.86		34.32		34.98		35.00		38.33		37.40		38.16		37.52	.20	37.60		35.10		31.27		31.02	
3	31.05	1.28	34.24		34.90		34.92		38.25		37.38	.14	38.10	.08	37.63	.36	37.50		35.05	.17	31.10		30.90	
4	31.72		34.28	1.00	34.88		35.87	2.35	38.22		37.38		38.04		37.73	.59	37.44	.24	34.90		31.00		30.84	
5	32.10		34.55		34.84		36.63		38.24	.08	37.38		37.98		37.92		37.49		34.78		30.90		30.75	
6	32.28		34.64	.02	34.74		36.75		38.22	.33	37.36	.01	37.98	.10	38.00		37.40	.58	34.60		30.70		29.44	...
7	32.45		34.65		34.63		36.75		38.18		37.42	.61	37.92	.01	37.95		37.38		34.45		30.63	.11	29.79	
8	32.64		34.65		34.53		36.75	.02	38.13		37.48		37.90	.15	37.88	.01	37.40	.36	34.30		30.46		29.63	
9	32.80		34.60	.06	34.44	.45	36.75		38.08		37.55		37.90		37.92	.03	37.40		34.20		30.25		29.45	
10	33.10	.56	34.55		34.37	.73	36.72	.08	38.20	1.67	37.65	.21	37.95	.48	37.88	.31	37.40		34.00		30.15	.68	29.27	.04
11	33.25		34.50		34.25		36.68		38.50	.27	37.72		38.00	.18	37.93		37.38	.01	33.80		30.12		29.16	.69
12	33.36		34.46	.14	34.20		36.70	.27	38.34		37.77		38.00		38.00		37.34		33.66		30.08	.01	29.16	.76
13	33.40		34.46		34.13		36.68		38.20		37.78		37.94		38.00		37.20		33.60		30.00		29.07	
14	33.40		34.45		34.00	.01	36.68		38.14		37.81	.14	37.87		37.95		37.10		33.48	.06	29.90		28.92	
15	33.43		34.45	.42	33.95	.44	36.68		38.13	.59	37.78		37.74		37.82		36.95		33.33		29.75		28.68	.65
16	33.44		34.38	.57	33.84	.02	36.66	1.22	38.26		37.75		37.58		37.81		36.73		33.16		29.55		28.53	.51
17	33.46		34.68		33.77	...	36.75		38.15		37.68	.04	37.65	2.02	37.65	.47	36.65		32.95		29.46		28.29	
18	33.50		34.68	.15	33.71		36.74		38.10		37.62		38.10	.01	37.59		36.48		32.84		29.35		28.06	
19	33.50		34.76		33.70	.01	36.71		38.06		37.48		38.10	.05	37.57	.20	36.35		32.70		29.12		28.18	.01
20	33.52		34.76		33.60		36.74	1.33	38.04		37.35		38.03		37.45		36.23		32.50	.60	28.93	.03	28.23	
21	33.55	.58	34.76	.05	33.55		36.67		38.02		37.27		37.95		37.37	.40	36.10	.19	32.45	.50	30.23	2.75	28.11	.05
22	33.90	.58	34.80		34.15	.58	36.60	.01	38.00	.06	37.16		37.91		37.43	.10	36.15		32.38		30.61		27.97	.09
23	34.10	.14	34.92		34.77		36.51		37.92		37.00		37.87		37.37	.10	36.10		32.37	.78	30.66		27.77	
24	34.27		35.08	.22	34.83		36.42		37.94	.25	36.88	.57	37.90	.14	37.33	.30	36.00	.33	32.18		30.63		27.56	
25	34.34		35.13		34.85		36.40		37.82		36.88		37.92		37.32		35.90		32.04		30.63	.89	27.34	
26	34.34		35.16		34.97	.54	36.38		37.78		36.82	.16	37.84		37.28		35.78		31.90		31.00		27.23	
27	34.28		35.16		35.10		36.38	.05	37.72		36.76		37.76		37.16		35.68	.04	31.70	.08	31.18		27.33	.05
28	34.22		35.16	.05	35.10		37.11	.14	37.62		37.30	2.47	37.68		37.08	.29	35.55	.38	31.56		31.33		27.42	
29	34.21	.68	35.16	...,			37.88		37.55		38.50	1.67	37.58		37.08		35.50		31.45		31.28		27.62	.09
30	34.38		35.11				38.10		37.50	.07	38.40		37.36		37.30	1.83	35.48		31.48	1.14	31.20		27.86	
31	34.40		35.05				38.33	.47			38.28				37.60		35.36				31.17	.02		
Totals.		3.82		2.68		2.78		5.94		3.32		6.02		3.22		6.63		2.13		3.32		4.49		3.06

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 37.40 feet. Rainfall for the year ending November 30, 1906, 47.41 inches.

LENGTH AND SIZE OF NEW PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1906.

Street.	Location.	Pipe.		Hydrants	Gates	Service.
		Size in Inches.	Length in Feet.			
Alvarado Avenue..	From end of pipe northerly to Belmont Street.....	8	146	..	1	Low.
Beeching	From end of pipe northerly.....	8	461	..	2	High.
Belmont.....	From Frank Street easterly.....	2	483	..	..	"
Belvidere Avenue..	From Burncoat Street easterly.....	6	473	1	1	"
Birch	From Maywood Street southerly.....	8	1,068	2	3	Low.
Byron	Between North and Nashua Streets.....	12	340	1	1	High.
Central.....	From Commercial Street easterly.....	12	600	2	2	"
Chester.....	From Holden Street to Grove Street and westerly	2	1,200	..	..	"
Drury Lane.....	Between Regent and Massachusetts Avenue westerly.	8	344	..	1	"
Dustin.....	From Belmont Street southerly.....	2	586	..	..	"
Emerson.....	From Fales Street westerly.....	6	746	1	2	"
Fairmont Avenue..	From end of pipe southerly.....	8	700	1	1	"
Fern.....	From Park Avenue westerly.....	8	425	1	1	Low.
Forest.....	From end of pipe northerly.....	16	912	1	1	High.
Grafton.....	From Union Square to Barclay Street.....	16	1,335	4	3	"
Grove.....	From Forest to Holden Street.....	16	1,650	2	2	"
Grove.....	From Chester Street southerly.....	2	516	..	..	"
Holden.....	From Grove Street to schoolhouse	2	694	..	..	
Hope Avenue.....	From end of pipe easterly.....	16	1,642	3	3	High.
Main.....	From end of pipe southwesterly	2	981	..	..	Low.
Millbury Avenue...	From end of pipe southerly	16	530	2	1	High.
North.....	From end of pipe easterly.....	16	1,285	2	2	"
Park Avenue.....	Between Highland and Lee Streets.....	12	86	..	..	"
Pleasant Terrace...	Between Pleasant and Russell Streets.....	16	373	..	1	Low.
Rena.....	From Belmont Street southerly.....	2	506	..	..	"
Russell	Between Pleasant and Elm Streets	2	467	..	..	High.
Seneca.....	From Evers Street easterly.....	8	803	1	3	Low.
Stockton Terrace..	From Vernon Street easterly.....	2	500	..	..	High.
Tracy Place.....	From Seneca Street northerly.....	6	186	..	1	"
Woodward.....	From Cambridge Street southerly.....	2	140	..	..	"
		12	700	1	2	"
Totals.....			20,878	25	34	

LENGTH AND SIZE OF PIPE RELAID DURING THE YEAR ENDING NOVEMBER 30, 1906.

Street.	Location.	Pipe.		Hydrants	Gates	Service
		Size in Inches.	Length in Feet.			
Belmont	From Fountain Street easterly	16	1,000	..	7	Low.
		12	170	..	..	
		8	121	..	..	
Foster	Between Commercial and Bridge Streets	16	984	3	2	Low.
Mitchell	From Pitt Street westerly	6	434	1	1	High.
Pitt	From Cambridge Street southerly	8	587	1	3	"
Totals			3,296	5	13	

Location, Size and Kind of Hydrants Located During the Year Ending November 30, 1906.

Street.	Location.	Kind.	Size.	Size of Connection.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Barclay	6′ S. of S. line of Grafton street	Matthews	8	8	2½	4	16	120	High
Belvidere avenue	3′ E. of E. line of house No. 8	"	6	6	2½	2	6	65	"
Birch	On S. line of house No. 47	Chapman	6	6	2½	2	8	60	Low
"	On N. line of house lot No. 83	"	6	6	2½	2	8	55	"
Byron	On N. line of lot No. 6	Matthews	8	8	2½	2	12	125	High
Central	12′ E. of E. line of Union street	Chapman	8	8	2½	4	12	145	"
"	33′ W. of E. line of building No. 131	"	8	8	2½	4	12	145	"
Emerson	On cor. Emerson street and Baltimore avenue	Matthews	6	6	2½	2	6	65	"
Fairmont avenue	On S. line of lot No. 1	"	6	6	2½	2	8	105	"
Fern	2′ E. of E. line of house No. 9	"	6	6	2½	2	8	65	Low
Forest	34′ S. of F. L. Allen's house	Chapman	8	8	2½	2	16	108	High
Foster	Opposite No. 93	Matthews	8	8	2½	2	16	65	Low
"	On N. W. cor. of Bridge and Foster streets	"	8	8	2½	3	16	70	"
"	On W. side of street, cor. of Mecantile street	"	8	8	2½	3	16	67	"
Grafton	On S. side of street opposite No. 105	"	8	8	2½	4	16	130	High
"	6′ 6″ S. of S. line of Union pl. on cor. Coral and Grafton Streets	"	8	8	2½	4	16	125	"
"	On S. W. cor. Grafton street and Penn avenue	"	8	8	2½	4	16	120	"
Grove	6′ N. of N. line of house No. 553	"	6	6	2½	2	16	105	"
"	105′ N. of N. line of Walker's ice house	"	8	8	2½	4	16	105	"
Holden	On N. line of Nelson place	"	8	8	2½	2	16	100	"
"	On S. line of lot No. 27	"	8	8	2½	2	16	85	"
"	On S. line of Chester street	"	8	8	2½	2	16	80	"
Main	26′ S. of S. line of Chandler street	"	8	6	2½	4	16	135	"
"	21′ N. of N. line of Odd Fellows' building	"	8	8	2½	4	16	130	"
Millbury avenue	On S. line of driveway to house No. 182	"	8	8	2½	2	16	115	"
" "	On N. line of Julian ave	"	8	8	2½	2	16	105	"
Mitchell	8′ E. of W. line of house No. 25	"	6	6	2½	2	6	150	"
Pitt	4′ N. of line of Sherman street	"	6	6	2½	2	8	152	"
Russell	Opp. N. line of Pleasant terrace	"	6	6	2½	2	8	58	Low
Woodward	On S. E. cor. Woodward and Crompton streets	Florence	8	8	2½	2	12	145	High
	Private Hydrants.								
Brussels	Extreme south end of M. J. Whittall's yard	Chapman	6	6	2½	2	8	150	High
Southbridge	In yard south of W. H. Leland's building	Matthews	6	6	2½	2	8	140	"

TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1906

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1906.....	13,004	98	76,649	253,529	216,881	24,858	180,809	14,331	129,307	2,717	29,520	30,028	25,113	6,134	15,743	192.93	1980	2821
Laid in 1906.....	6,073			1,839	4,655		1,896		9,711							4.58	32	47
Totals	19,077	98	76,649	255,368	221,536	24,858	182,705	14,331	139,018	2,717	29,520	30,028	25,113	6,134	15,743	197.51		
Pipe taken up 1906....			360	70	1,143											.29		
Total Feet.....	19,077	98	76,289	255,298	220,393	24,858	182,705	14,331	139,018	2,717	29,520	30,028	25,113	6,134	15,743		2012	2868
Total Miles.....	3.613	.018	14.448	48.36	41.741	4.708	34.603	2.714	26.329	.514	5.59	5.687	4.756	1.161	2.98	197.22		

TABLE

Showing the daily height of water in KETTLE BROOK No. 2 RESERVOIR for year ending November 30, 1906.

Date.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September	October.	November.
	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.
1	13.50	19.45	21.40	21.40	21.47	21.43	21.50	21.50	21.45	21.40	21.45	21.46
2	13.75	19.47	21.40	21.40	21.47	21.40	21.47	21.48	21.42	21.36	21.42	21.42
3	13.97	19.48	21.40	21.40	21.45	21.45	21.45	21.50	21.42	21.36	21.40	21.40
4	14.57	19.60	21.40	21.55	21.45	21.45	21.45	21.53	21.42	21.36	21.40	21.40
5	14.72	19.80	21.40	21.45	21.47	21.40	21.45	21.52	21.47	21.33	21.40	21.40
6	14.95	19.88	21.40	21.42	21.55	21.40	21.47	21.52	21.47	21.32	21.40	21.40
7	15.05	19.95	21.40	21.40	21.47	21.50	21.47	21.45	21.48	21.30	21.40	21.40
8	15.20	19.95	21.40	21.40	21.45	21.48	21.47	21.45	21.48	21.30	21.38	21.38
9	15.35	20.00	21.40	21.40	21.45	21.47	21.48	21.45	21.45	21.28	21.35	21.38
10	15.47	20.00	21.40	21.40	21.57	21.50	21.48	21.45	21.43	21.28	21.47	21.40
11	15.55	20.00	21.40	21.40	21.63	21.45	21.50	21.55	21.43	21.27	21.45	21.40
12	16.20	20.03	21.40	21.40	21.53	21.45	21.47	21.47	21.40	21.25	21.43	21.53
13	16.80	20.13	21.40	21.40	21.47	21.45	21.43	21.45	21.40	21.25	21.40	21.52
14	16.95	20.15	21.40	21.40	21.45	21.45	21.40	21.45	21.38	21.23	21.40	21.47
15	17.00	20.17	21.40	21.40	21.45	21.44	21.40	21.42	21.37	21.23	21.40	21.45
16	17.05	20.23	21.40	21.40	21.55	21.43	21.38	21.42	21.37	21.20	21.40	21.52
17	17.40	20.53	21.40	21.40	21.47	21.43	21.60	21.40	21.37	21.18	21.39	21.45
18	17.65	20.57	21.40	21.40	21.45	21.44	21.58	21.47	21.35	21.18	21.39	21.43
19	17.85	20.63	21.40	21.40	21.45	21.42	21.55	21.45	21.30	21.16	21.40	21.67
20	18.10	20.68	21.40	21.40	21.43	21.40	21.52	21.40	21.30	21.15	21.60	21.65
21	18.45	20.72	21.40	21.40	21.43	21.38	21.48	21.40	21.35	21.25	21.68	21.60
22	18.78	20.80	21.50	21.40	21.43	21.38	21.45	21.40	21.37	21.25	21.55	21.57
23	18.90	20.95	21.43	21.40	21.43	21.38	21.45	21.43	21.35	21.40	21.52	21.50
24	19.00	21.12	21.40	21.40	21.43	21.35	21.47	21.45	21.38	21.40	21.50	21.50
25	19.08	21.20	21.40	21.40	21.38	21.42	21.47	21.45	21.30	21.38	21.53	21.47
26	19.05	21.25	21.43	21.40	21.40	21.45	21.43	21.42	21.25	21.37	21.62	21.47
27	19.08	21.28	21.40	21.40	21.40	21.46	21.43	21.40	21.27	21.37	21.55	21.47
28	19.10	21.30	21.40	21.53	21.40	21.75	21.40	21.40	21.47	21.37	21.52	21.20
29	19.20	21.37		21.45	21.40	21.85	21.38	21.40	21.45	21.37	21.48	21.00
30	19.35	21.40		21.42	21.40	21.65	21.38	21.60	21.45	21.43	21.45	20.80
31	19 40	21.40		21.55		21.55		21.48	21.42		21.45	

The depth of water is shown in feet and decimals of a foot. Height of rollway 21.34 feet.

TABLE

Showing the daily height of water in KETTLE BROOK No. 3 RESERVOIR for year ending November 30, 1906.

Date.	DECEMBER.	JANUARY.	FEBRUARY.	MARCH.	APRIL.	MAY.	JUNE.	JULY.	AUGUST.	SEPT.	OCTOBER.	NOVEMBER
	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.	Water.
1	18.27	15.85	19.90	22.15	26.10	26.05	26.10	26.10	26.05	26.02	26.02	26.04
2	17.78	15.95	20.00	22.20	26.10	26.05	26.10	26.08	26.03	25.98	26.00	26.02
3	17.50	16.00	20.05	22.22	26.07	26.07	26.10	26.10	26.02	25.98	26.00	26.00
4	17.83	16.20	20.10	22.90	26.07	26.05	26.08	26.13	26.02	25.98	26.00	26.00
5	17.57	16.60	20.15	23.32	26.10	26.05	26.05	26.13	26.08	25.95	26.00	26.00
6	17.30	16.75	20.18	23.50	26.20	26.05	26.08	26.13	26.08	25.94	26.00	26.00
7	17.07	16.85	20.20	23.60	26.13	26.12	26.08	26.08	26.09	25.94	26.00	26.00
8	16.77	16.92	20.23	23.67	26.10	26.10	26.08	26.08	26.09	25.94	25.98	25.98
9	16.55	17.00	20.25	23.73	26.10	26.10	26.09	26.08	26.08	25.93	25.96	25.98
10	16.20	17.05	20.30	23.85	26.10	26.12	26.09	26.07	26.05	25.93	26.05	26.00
11	16.00	17.08	20.32	23.90	26.23	26.08	26.10	26.10	26.03	25.92	26.03	26.00
12	15.43	17.13	20.35	24.00	26.15	26.07	26.07	26.07	26.03	25.91	26.00	26.12
13	15.20	17.30	20.38	24.10	26.13	26.07	26.03	26.05	26.02	25.91	26.00	26.10
14	14.80	17.35	20.40	24.15	26.10	26.07	26.02	26.05	26.00	25.91	26.00	26.07
15	14.55	17.45	20.43	24.20	26.10	26.07	26.00	26.03	26.00	25.90	26.00	26.05
16	14.23	17.50	20.45	24.33	26.15	26.05	26.00	26.03	26.00	25.88	26.00	26.15
17	13.80	17.95	20.45	24.37	26.10	26.05	26.22	26.01	26.00	25.87	25.98	26.05
18	13.50	18.02	20.47	24.40	26.10	26.05	26.18	26.07	25.98	25.87	25.98	26.03
19	13.20	18.19	20.50	24.45	26.08	26.05	26.15	26.03	25.95	25.88	26.00	26.23
20	12.85	18.27	20.55	24.55	26.05	26.03	26.13	26.01	25.95	25.88	26.00	26.20
21	12.38	18.38	20.57	24.65	26.05	26.00	26.12	26.01	26.00	25.98	26.27	26.15
22	13.75	18.60	21.05	24.70	26.05	26.00	26.10	26.01	26.02	25.98	26.15	26.12
23	14.25	18.85	21.20	24.75	26.05	26.00	26.10	26.03	26.05	26.00	26.10	26.07
24	14.60	19.22	21.45	24.75	26.05	26.00	26.10	26.05	26.08	26.00	26.09	26.07
25	14.75	19.42	21.55	24.77	26.03	26.04	26.10	26.05	26.08	25.97	26.10	26.05
26	14.85	19.57	21.85	24.80	26.05	26.08	26.05	26.02	26.05	25.95	26.20	26.05
27	14.95	19.60	22.05	24.95	26.05	26.07	26.05	26.00	26.05	25.95	26.13	26.05
28	15.00	19.65	22.10	25.35	26.05	26.32	26.02	26.00	26.12	25.95	26.10	26.00
29	15.20	19.70		25.65	26.05	26.45	26.00	26.00	26.08	25.95	26.06	26.00
30	15.48	19.75		25.90	26.05	26.25	26.00	26.20	26.08	26.03	26.03	26.00
1	15.68	19.85		26.10		26.15		26.08	26.04		26.03	

The depth of water is shown in feet and decimals of a foot. Height of rollway 26.00 6eet.

TABLE

Showing the daily height of water in KETTLE BROOK No. 4 RESERVOIR and the rainfall for year ending November 30, 1906.

Date.	December		January.		Febuary.		March.		April.		May.		June.		July.		August.		Sept.		October.		November	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	17.85		16.75		19.37		21.10		24.63		27.70		27.85		27.52	1.47	27.75	.01	27.74		27.65		27.77	
2	17.67		16.80		19.40		21.10		24.75		27.72		27.83		27.52	.28	27.75		27.70		27.64		27.75	
3	17.45		16.85		19.40		21.12		24.83		27.75	.17	27.80	.22	27.55	.22	27.75		27.70	.20	27.63		27.73	
4	17.65	1.66	16.97	.63	19.40		21.63	.41	24.92		27.75		27.78		27.62	.78	27.75	.35	27.70		27.63		27.73	
5	17.50		17.20		19.42		22.00		25.03	.12	27.77		27.77		27.50		27.82	.65	27.67		27.63		27.73	
6	17.27		17.30	.05	19.45		22.10		25.23		27.77	.14	27.80	.35	27.37		27.82	.22	27.65		27.63	.15	27.73	
7	16.75		17.35		19.45		22.17		25.33	.05	27.85	.57	27.80		27.42		27.82		27.63		27.63		27.73	
8	16.78		17.37	.11	19.47		22.25		25.40		27.83	.01	27.80	.21	27.40		27.82	.38	27.62		27.62		27.72	
9	16.60		17.40		19.47	.87	22.30	.05	25.47		27.83	.21	27.81	.30	27.37		27.80	.03	27.62		27.62	.01	27.71	
10	16.42	.75	17.40		19.55		22.35		25.70	.95	27.85	.01	27.82	.06	27.35	.06	27.77		27.62		27.75	.22	27.73	
11	16.17		17.40		19.57		22.40		26.18		27.83		27.83	.36	27.45	.29	27.77		27.61		27.75	.02	27.73	1.12
12	16.08	.01	17.50	.26	19.58		22.48	.20	26.43		27.80	.23	27.80		27.42		27.76		27.60		27.75		27.83	.11
13	16.00		17.58		19.60		22.52		26.53		27.80		27.77		27.40		27.74		27.60		27.75		27.82	
14	15.90		17.60	.26	19.65		22.57		26.63	.34	27.80	.14	27.76		27.37		27.73		27.58		27.74		27.80	
15	15.83		17.70		19.67		22.60		26.73	.77	27.80		27.75		27.35		27.73		27.56		27.74		27.78	
16	15.70		17.75	.65	19.67	1.01	22.77	.83	27.00		27.80		27.73		27.33	.01	27.72		27.54		27.74		27.82	.82
17	15.60		18.05		19.68		22.78		27.12		27.80	.09	27.85	1.70	27.33	1.02	27.70		27.52		27.73		27.80	
18	15.45		18.15		19.68		22.80		27.20		27.80	.07	27.82	.04	27.43		27.68		27.51		27.73		27.78	
19	15.38		18.22	.18	19.70		22.83	1.05	27.25		27.80		27.75	.05	27.43		27.65		27.50		27.73		27.95	.12
20	15.30		18.27	.06	19.72		22.92		27.30		27.80		27.70		27.43	.03	27.65	.13	27.49	.45	27.74	2.30	27.95	
21	15.25	1.24	18.35		19.75	.38	22.97		27.37		27.75		27.62		27.43		27.70		27.58	.29	27.95	.07	27.90	.13
22	15.73		18.50		20.22	.49	23.00		27.43	.11	27.73		27.62		27.45	.80	27.72	.95	27.58	.78	27.87		27.85	
23	15.95	.16	18.65	.05	20.45		23.02		27.45	.24	27.78		27.58	.05	27.55	.21	27.80	1.05	27.63	.13	27.84		27.83	
24	16.10		18.98	.19	20.58		23.03		27.53		27.72	.29	27.55	.11	27.57		27.82	.47	27.65		27.82		27.80	
25	16.18		19.03		20.62		23.05		27.55		27.75	.24	27.45	.02	27.54	.05	27.82		27.63		27.85	.75	27.79	
26	16.23		19.06		20.87	.56	23.07		27.58		27.77	.17	27.44		27.54		27.80		27.62		27.90		27.79	
27	16.25		19.13		21.00		23.13	.36	27.60		27.78	.59	27.42		27.54	.05	27.77		27.60	.15	27.85		27.79	.09
28	16.33		19.17		21.05		23.73		27.63		27.97	3.52	27.42		27.53		27.82		27.60		27.82		27.77	.06
29	16.40	.60	19.23				24.10		27.65		28.10	.62	27.40		27.53	.08	27.80	1.05	27.60		27.78		27.74	
30	16.60	.03	19.27				24.30	.28	27.68	.12	27.98		27.40		27.70	1.45	27.80		27.65	.78	27.76		27.35	
31	16.73		19.30	.04			24.50				27.85				27.75	.01	27.77				27.76	.13		
Totals.		4.45		2.48		3.31		3.18		2.70		7.07		3.47		6.81		5.29		2.78		3.65		2.45

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 27.74. Rainfall for year ending November 30, 1906, 47.64 inches.

TABLE

Showing the daily height of water in HOLDEN No. 1 RESERVOIR and the rainfall for year ending Nov. 30, 1906.

Date.	December		January.		February.		March.		April.		May.		June.		July.		August.		Sept.		October.		Nov.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	18.72		20.81		24.26		25.76		30.29		31.47		31.20		31.21	1.18	31.19		29.72		27.06		25.88	
2	18.75		20.89		24.32		25.76		30.24		31.35		31.29		31.16	.34	31.13		29.45		26.97		25.82	
3	18.74	1.36	20.95		24.34		25.76	.28	30.23		31.43	.17	31.43	.05	31.25	.13	31.11		29.35	.11	26.91		25.73	
4	19.15	.02	21.08	.94	24.31		26.46	1.74	30.23		31.33		31.37		31.36	.64	31.09	.22	29.20		26.74		25.68	
5	19.33		21.40		24.31		27.18		30.23	.17	31.35		31.40		31.44		31.11	.20	29.14		26.50		25.63	
6	19.24		21.56	.05	24.31		27.40		30.49	.38	31.33		31.41	.43	31.46		31.13	.15	28.98		26.49	.18		
7	19.22		21.68		24.31		27.59		30.70		31.28	.56	31.40		31.45		31.06		28.97				25.44	
8	19.23		21.76		24.26		27.75	.08	30.91		31.32		31.40	.22	31.43	.06	31.06	.26	28.83		26.21		25.36	
9	19.21		21.81	.08	24.20	1.11	27.85	.07	31.04		31.32	.20	31.39	.27	31.43		31.09		28.77		26.22		25.31	
10	19.25	.82	21.85		24.22		27.95		31.28	1.68	31.32	.04	31.37	.36	31.43	1.39	31.06		28.68		26.22	.71	25.30	.06
11	19'27		21.88		24.17		28.08		31.63		31.27		31.42		31.48		31.06	.02	28.58		26.17	.02	25.26	
12	19.30		21.92	.17	24.17		28.20		31.41		31.29		31.40		31.48		31.02	.01	28.48		26.09		25.36	1.24
13	19.23		21.99		24.12	.02	28.27	.27	31.23		31.31		31.33		31.39		30.99		28.40		25.97		25.37	
14	19.20		22.09	.33	24.08		28.36		31.32		31.27	.12	31.25		31.37		30.97		28.28	.02	25.88		25.38	
15	19.16		22.13		24.08	.52	28.43		31.36	.64	31.26		31.21		31.31				28.20		25.81		25.39	.62
16	19.12		22.19	.62	24.05		28.56	1.18	31.33		31.29		31.12	.05	31.26		30.83		28.08		25.73		25.44	.30
17	19.10		22.56		24.01		28.59		31.43		31.25	.21	31.43	2.02	31.23	.88	30.81		27.98		25.65		25.43	
18	19.09		22.70	.20	23.98		28.65		31.51		31.30	.04	31.53	.07	31.33	.05	30.77		27.85		25.60		25.71	
19	19.04		22.85		23.95		28.68		31.38		31.25		31.45	.04	31.27		30.74		27.78		25.52	.05	25.81	.62
20	18.99		22.93		23.93		28.87	1.23	31.36		31.18		31.50		31.23		30.71		27.70	.49	25.45	2.25	26.01	
21	19.01	1.03	22.99	.07	23.89	.11	28.91		31.42		31.15		31.48		31.18	.46	30.72	.78	27.55	.41	25.83	.05	26.15	.06
22	19.48		23.17		24.47	.59	28.99		31.37	.05	31.05		31.46		31.27		30.71	.04	27.58	.62	25.87		26.17	.08
23	19.86	.20	23.33	.02	24.83		29.03		31.36	.19	30.95		31.43	.08	31.21	.47	30.85		27.62	.14	25.91	.02		
24	19.95		23.59	.23	24.97		29.03				30.88	.44	31.42	.11	31.21	.15		.41	27.66		25.86		26.26	
25	20.05		23.78		25.08		29.08		31.33		30.95	.10	31.41	.02	31.21		30.75		27.48		25.88	.95	26.35	
26	20.11		23.89		25.33	.58	29.12		31.36		30.96	.13	31.33		31.15		30.56		27.39		25.99		26.40	
27	20.15		23.98		25.62		29.15	.21	31.36		30.95	.36	31.26		31.11	.02	30.50	.09	27.31	.14	26.09		26.46	.11
28	20.18		24.06	.05	25.73		29.67	.03	31.45		31.34	2.93	31.16		31.07	.23	30.41	.75	27.24		26.04		26.49	.10
29	20.33	.65	24.13				30.25		31.39		31.81	.58	31.06		31.03		30.34		27.10		26.04			
30	20.57		24.17				30.35	.21	31.40	.09	31.48		31.04		31.13	1.79	30.16		27.13	.83	25.83	.02	26.62	
31	20.73		24.23				30.36	.11			31.25				31.15		29.97				25.76	.12		
Totals.		4.08		2.76		2.93		5.41		3.20		5.88		3.72		7.79		2.93		2.76		4.37		2.59

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 30.10.
Rainfall for year ending November 30, 1906, 48.42 inches.

TABLE

Showing the daily height of water in HOLDEN No. 2 RESERVOIR and the rainfall for year ending Nov. 30, 1906.

Date.	December		January.		February.		March.		April.		May.		June.		July.		August.		Sept.		October.		November	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	37.00		37.78		37.68		38.08		38.98		40.16		40.05		40.16	1.18	38.62		38.08		38.13		38.33	
2	37.03		37.71		37.63		38.08		38.90		40.03		40.01		40.14	.34	38.59		38.36		38.08		38.31	
3	37.15	1.36	37.63		37.56		38.10	.28	38.94		40.11	.17	39.96	.05	40.17	.13	38.50		38.44	.11	38.08		38.31	
4	37.26	.02	37.68	.94	37.48		38.58	1.74	38.94		40.08		39.96		40.18	.64	38.42	.22	38.57		38.10		38.28	
5	37.27		37.80		37.51		38.75		39.29	.17	40.11		39.91		40.16		38.46	.20	38.52		38.28		38.27	
6	37.27		37.76	.05	37.49		38.70		39.48	.38	40.11		39.96	.43	40.02		38.42	.15	38.52		38.28	.18	38.13	
7	37.29		37.73		37.42		38.60		39.58		40.06	.56	40.05		39.91		38.38		38.52		38.28		38.13	
8	37.31		37.76		37.42		38.58	.08	39.52		40.05		40.06	.22	39.85	.06	38.31	.26	38.48		38.28		38.11	
9	37.33		37.73	.08	37.45	1.11	38.54	.07	39.52		40.03	.20	40.19	.27	39.78		38.19		38.47		38.30		38.10	
10	37.37	.82	37.68		37.53		38.55		39.85	1.68	40.07	.04	40.25	.36	39.66	1.39	38.03		38.45		38.41	.71	38.10	.06
11	37.43		37.63		37.56		38.54		39.83		39.99		40.09		39.68		37.90	.02	38.40		38.46	.02	38.11	
12	37.44		37.54	.17	37.56		38.55		39.56		40.02		40.06		39.60		37.80	.01	38.38		38.49		38.25	1.24
13	37.45		37.60		37.59	.02	38.47	.27	39.59		40.02		40.02		39.49		37.73		38.33		38.43		38.26	
14	37.45		37.58	.33	37.60		38.40		39.91		40.08	.12	39.96		39.39		37.56		38.35	.02	38.40		38.27	
15	37.43		37.62		37.65	.52	38.30		40.08	.64	39.98		39.89		39.29		37.42		38.34		38.42		38.28	.62
16	37.41		37.60	.62	37.68		38.35	1.18	39.80		39.91		39.87	.05	39.25		37.18		38.33		38.39		38.36	.30
17	37.40		37.79		37.68		38.40		40.03		39.86	.21	40.15	2.02	39.14	.88	37.11		38.36		38.36		38.37	
18	37.40		37.72	.20	37.69		38.39		40.06		39.88	.04	40.02	.07	39.13	.05	36.93		38.35		38.26		38.38	
19	37.40		37.70		37.71		38.37		40.02		39.80		39.96	.04	39.05		36.71		38.32		38.18	.05	38.45	.02
20	37.40		37.62		37.71		38.35	1.23	39.98		39.81		39.96		38.95		36.65		38.32	.49	38.13	2.25	38.46	
21	37.48	1.03	37.57	.07	37.72	.11	38.29		40.08		39.81		39.98		38.83	.46	36.53	.78	38.38	.41	38.40	.05	38.42	.06
22	37.55		37.68		37.95	.59	38.19		40.09	.05	39.81		39.99		38.81		36.40	.04	38.42	.62	38.41		38.46	.08
23	37.71	.20	37.73	.02	38.02		38.11		39.97	.19	39.81		40.01	.08	38.81	.47	36.26		38.42	.14	38.40	.02	38.48	
24	37.74		37.87	.23	38.02		38.00		40.01		39.78	.44	40.03	.11	38.73	.15	36.35	.41	38.35		38.39		38.48	
25	37.76		37.81		37.96		37.91		39.91		39.75	.10	40.04	.02	38.68		36.40		38.17		38.32	.96	38.48	
26	37.78		37.75		38.09	.58	37.87		39.89		39.79	.13	40.06		38.53		36.45		38.09		38.40		38.48	
27	37.79		37.72		38.11		37.81	.21	39.93		39.70	.36	40.01		38.48	.02	36.63	.09	38.06	.14	38.40		38.45	.11
28	37.73		37.69	.05	38.06		38.00	.03	39.95		39.99	2.93	40.02		38.33	.23	37.02	.75	38.13		38.33		38.40	.10
29	37.71	.65	37.75				38.25		40.01		39.83	.58	40.03		38.35		37.18		38.07		38.32		38.44	
30	37.76		37.68				38.93	.21	40.12	.09	39.58		40.02		38.67	1.79	37.43		38.15	.83	38.31	.02	38.40	
31	37.77		37.69				39.06	.11			39.85				38.69		37.75				38.32	.12		
Totals,		4.03		2.76		2.93		5.41		3.20		5.88		3.72		7.79		2.93		2.76		4.37		2.59

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 38.76 feet.
Rainfall for the year ending November 30, 1906, 48.42

TABLE

Showing the daily height of water in LYNDE BROOK RESERVOIR and the rainfall for year ending Nov. 30, 1906.

Date.	December		January.		February.		March.		April.		May.		June.		July.		August.		Sept.		October.		Nov.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	30.60		34.38		35.00		35.06		38.38		37.45		38.20		37.40	1.44	37.66		35.25		31.40		31.08	.12
2	30.86		34.32		34.98		35.00		38.33		37.40		38.16		37.52	.20	37.60		35.10		31.27		31.02	
3	31.05	1.28	34.24		34.90		34.92		38.25		37.38	.14	38.10	.08	37.63	.36	37.50		35.05	.17	31.10		30.90	
4	31.72		34.28	1.00	34.88		35.87	2.35	38.22		37.38		38.04		37.73	.59	37.44	.24	34.90		31.00		30.84	
5	32.10		34.55		34.84		36.63		38.24	.08	37.38		37.98		37.92		37.49		34.78		30.90		30.75	
6	32.28		34.64	.02	34.74		36.75		38.22	.33	37.36	.01	37.98	.10	38.00		37.40	.58	34.60		30.70		29.44	...
7	32.45		34.65		34.63		36.75		38.18		37.42	.61	37.92	.01	37.95		37.38		34.45		30.63	.11	29.79	
8	32.64		34.65		34.53		36.75	.02	38.13		37.48		37.90	.15	37.88	.01	37.40	.36	34.30		30.46		29.63	
9	32.80		34.60	.06	34.44	.45	36.75		38.08		37.55		37.90		37.92	.03	37.40		34.20		30.25		29.45	
10	33.10	.56	34.55		34.37	.73	36.72	.08	38.20	1.67	37.65	.21	37.95	.48	37.88	.31	37.40		34.00		30.15	.68	29.27	.04
11	33.25		34.50		34.25		36.68		38.50	.27	37.72		38.00	.18	37.93		37.38	.01	33.80		30.12		29.16	.69
12	33.36		34.46	.14	34.20		36.70	.27	38.34		37.77		38.00		38.00		37.34		33.66		30.08	.01	29.16	.76
13	33.40		34.46		34.13		36.68		38.20		37.78		37.94		38.00		37.20		33.60		30.00		29.07	
14	33.40		34.45		34.00	.01	36.68		38.14		37.81	.14	37.87		37.95		37.10		33.48	.05	29.90		28.92	
15	33.43		34.45	.42	33.95	.44	36.68		38.13	.59	37.78		37.74		37.82		36.95		33.33		29.75		28.68	.65
16	33.44		34.38	.57	33.84	.02	36.66	1.22	38.26		37.75		37.58		37.81		36.73		33.16		29.55		28.53	.51
17	33.46		34.68		33.77	...	36.75		38.15		37.68	.04	37.65	2.02	37.65	.47	36.65		32.95		29.46		28.29	
18	33.50		34.68	.15	33.71		36.74		38.10		37.62		38.10	.01	37.59		36.48		32.84		29.35		28.06	
19	33.50		34.76		33.70	.01	36.71		38.06		37.48		38.10	.05	37.57	.20	36.35		32.70		29.12		28.18	.01
20	33.52		34.76		33.60		36.74	1.33	38.04		37.35		38.03		37.45		36.23		32.50	.60	28.93	.03	28.23	
21	33.55	.58	34.76	.05	33.55		36.67		38.02		37.27		37.95		37.37	.40	36.10	.19	32.45	.50	30.23	2.75	28.11	.05
22	33.90	.58	34.80		34.15	.58	36.60	.01	38.00	.06	37.16		37.91		37.43	.10	36.15		32.38		30.61		27.97	.09
23	34.10	.14	34.92		34.77		36.51		37.92		37.00		37.87		37.37	.10	36.10		32.37	.78	30.66		27.77	
24	34.27		35.08	.22	34.83		36.42		37.94	.25	36.88	.57	37.90	.14	37.33	.30	36.00	.33	32.18		30.63		27.56	
25	34.34		35.13		34.85		36.40		37.82		36.88		37.92		37.32		35.90		32.04		30.63	.89	27.34	
26	34.34		35.16		34.97	.54	36.38		37.78		36.82	.16	37.84		37.28		35.78		31.90		31.00		27.23	
27	34.28		35.16		35.10		36.38	.05	37.72		36.76		37.76		37.16		35.68	.04	31.70	.08	31.18		27.33	.05
28	34.22		35.16	.05	35.10		37.11	.14	37.62		37.30	2.47	37.68		37.08	.29	35.55	.38	31.56		31.33		27.42	
29	34.21	.68	35.16	...,			37.88		37.55		38.50	1.67	37.58		37.08		35.50		31.45		31.28		27.62	.09
30	34.38		35.11				38.10		37.50	.07	38.40		37.36		37.30	1.83	35.48		31.48	1.14	31.20		27.86	
31	34.40		35.05				38.33	.47			38.28				37.60		35.36				31.17	.02	...	
Totals.		3.82		2.68		2.78		5.94		3.32		6.02		3.22		6.63		2.13		3.32		4.49		3.06

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 37.40 feet. Rainfall for the year ending November 30, 1906, 47.41 inches.

LENGTH AND SIZE OF NEW PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1906.

Street.	Location.	Pipe.		Hydrants	Gates	Service.
		Size in Inches.	Length in Feet.			
Alvarado Avenue..	From end of pipe northerly to Belmont Street.....	8	146	..	1	Low.
Beeching	From end of pipe northerly.....	8	461	..	2	High.
Belmont.....	From Frank Street easterly.....	2	483	..	..	"
Belvidere Avenue..	From Burncoat Street easterly.....	6	473	1	1	"
Birch	From Maywood Street southerly.....	8	1,068	2	3	Low.
Byron	Between North and Nashua Streets.....	12	340	1	1	High.
Central.....	From Commercial Street easterly.....	12	600	2	2	"
Chester.....	From Holden Street to Grove Street and westerly	2	1,200	..	..	"
Drury Lane.....	Between Regent and Massachusetts Avenue westerly.	8	344	..	1	"
Dustin.....	From Belmont Street southerly.....	2	586	..	..	"
Emerson.....	From Fales Street westerly.....	6	746	1	2	"
Fairmont Avenue..	From end of pipe southerly.....	8	700	1	1	"
Fern.....	From Park Avenue westerly.....	8	425	1	1	Low.
Forest.....	From end of pipe northerly.....	16	912	1	1	High.
Grafton.....	From Union Square to Barclay Street.....	16	1,335	4	3	"
Grove.....	From Forest to Holden Street.....	16	1,650	2	2	"
Grove.....	From Chester Street southerly.....	2	516	..	..	"
Holden.....	From Grove Street to schoolhouse	2	694	..	..	
		16	1,642	3	3	High.
Hope Avenue.....	From end of pipe easterly.....	2	981	..	..	Low.
Main.....	From end of pipe southwesterly	16	530	2	1	High.
Millbury Avenue...	From end of pipe southerly	16	1,285	2	2	"
North.....	From end of pipe easterly.....	12	86	..	..	"
Park Avenue.....	Between Highland and Lee Streets.....	16	373	..	1	Low.
Pleasant Terrace...	Between Pleasant and Russell Streets.....	2	506	..	..	"
Rena.....	From Belmont Street southerly.....	2	467	..	..	High.
Russell	Between Pleasant and Elm Streets	8	803	1	3	Low.
Seneca.....	From Evers Street easterly.....	2	500	..	..	High.
Stockton Terrace..	From Vernon Street easterly.....	6	186	..	1	"
Tracy Place.....	From Seneca Street northerly.....	2	140	..	..	"
Woodward.....	From Cambridge Street southerly.....	12	700	1	2	"
Totals.....			20,878	25	34	

LENGTH AND SIZE OF PIPE RELAID DURING THE YEAR ENDING NOVEMBER 30, 1906.

STREET.	LOCATION.	PIPE.		Hydrants	Gates	Service
		Size in Inches.	Length in Feet.			
Belmont	From Fountain Street easterly	16	1,000	..	7	Low.
		12	170	..	..	
		8	121	..	..	
Foster	Between Commercial and Bridge Streets	16	984	3	2	Low.
Mitchell	From Pitt Street westerly	6	434	1	1	High.
Pitt	From Cambridge Street southerly	8	587	1	3	"
Totals			3,296	5	13	

Location, Size and Kind of Hydrants Located During the Year Ending November 30, 1906.

Street.	Location.	Kind.	Size.	Size of Connection.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Barclay	6′ S. of S. line of Grafton street	Matthews	8	8	2½	4	16	120	High
Belvidere avenue	3′ E. of E. line of house No. 8	"	6	6	2½	2	6	65	"
Birch	On S. line of house No. 47	Chapman	6	6	2½	2	8	60	Low
"	On N. line of house lot No. 83	"	6	6	2½	2	8	55	"
Byron	On N. line of lot No. 6	Matthews	8	8	2½	2	12	125	High
Central	12′ E. of E. line of Union street	Chapman	8	8	2½	4	12	145	"
"	33′ W. of E. line of building No. 131	"	8	8	2½	4	12	145	"
Emerson	On cor. Emerson street and Baltimore avenue	Matthews	6	6	2½	2	6	65	"
Fairmont avenue	On S. line of lot No. 1	"	6	6	2½	2	8	105	"
Fern	2′ E. of E. line of house No. 9	"	6	6	2½	2	8	65	Low
Forest	34′ S. of F. L. Allen's house	Chapman	8	8	2½	2	16	108	High
Foster	Opposite No. 93	Matthews	8	8	2½	2	16	65	Low
"	On N. W. cor. of Bridge and Foster streets	"	8	8	2½	3	16	70	"
"	On W. side of street, cor. of Mecantile street	"	8	8	2½	3	16	67	"
Grafton	On S. side of street opposite No. 105	"	8	8	2½	4	16	130	High
"	6′ 6″ S. of S. line of Union pl. on cor. Coral and Grafton 3treets	"	8	8	2½	4	16	125	"
"	On S. W. cor. Grafton street and Penn avenue	"	8	8	2½	4	16	120	"
Grove	6′ N. of N. line of house No. 553	"	6	6	2½	2	16	105	"
"	105′ N. of N. line of Walker's ice house	"	8	8	2½	4	16	105	"
Holden	On N. line of Nelson place	"	8	8	2½	2	16	100	"
"	On S. line of lot No. 27	"	8	8	2½	2	16	85	"
"	On S. line of Chester street	"	8	8	2½	2	16	80	"
Main	26′ S. of S. line of Chandler street	"	8	6	2½	4	16	135	"
"	21′ N. of N. line of Odd Fellows' building	"	8	8	2½	4	16	130	"
Millbury avenue	On S. line of driveway to house No. 182	"	8	8	2½	2	16	115	"
" "	On N. line of Julian ave	"	8	8	2½	2	16	105	"
Mitchell	8′ E. of W. line of house No. 25	"	6	6	2½	2	6	150	"
Pitt	4′ N. of line of Sherman street	"	6	6	2½	2	8	152	"
Russell	Opp. N. line of Pleasant terrace	"	6	6	2½	2	8	58	Low
Woodward	On S. E. cor. Woodward and Crompton streets	Florence	8	8	2½	2	12	145	High
	Private Hydrants.								
Brussels	Extreme south end of M. J. Whittall's yard	Chapman	6	6	2½	2	8	150	High
Southbridge	In yard south of W. H. Leland's building	Matthews	6	6	2½	2	8	140	"

TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1906

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1906	13,004	98	76,649	253,529	216,881	24,858	180,809	14,331	129,307	2,717	29,520	30,028	25,113	6,134	15,743	192.93	1980	2821
Laid in 1906	6,073			1,839	4,655		1,896		9,711							4.58	32	47
Totals	19,077	98	76,649	255,368	221,536	24,858	182,705	14,331	139,018	2,717	29,520	30,028	25,113	6,134	15,743	197.51		
Pipe taken up 1906			360	70	1,143											.29		
Total Feet	19,077	98	76,289	255,298	220,393	24,858	182,705	14,331	139,018	2,717	29,520	30,028	25,113	6,134	15,743		2012	2868
Total Miles	3,613	.018	14,448	48.36	41.741	4.708	34.603	2.714	26.329	.514	5.59	5.687	4.756	1.161	2.98	197.22		

SERVICE PIPES LAID TO NOVEMBER 30, 1906.

	In the Street.		Premises of Individuals.		No.
	Feet.	Miles.	Feet.	Miles.	
Prior to 1887	171,603.36	32.498	188,386.48	35.676	7,629
1887	9,674.	1.832	11,418.25	2.162	469
1888	8,814.75	1.669	13,872.	2.627	431
1889	10,021.75	1.898	11,264.5	2.133	472
1890	9,300.58	1.761	13,972.9	2.644	449
1891	9,307.5	1 762	14,276.66	2.704	483
1892	10,012.58	1.896	12,803.25	2.424	506
1893	8,616.25	1.631	11,064.	2 095	430
1894	7,218.	1.367	11,035.	2.09	366
1895	7,469.	1.414	12,407.	2.35	366
1896	7,067.83	1.34	8,796.	1.66	346
1897	8,324.11	1.576	9.805,2	1.857	383
1898	7,291.	1.38	12,878.75	2.439	342
1899	7,234.25	1.37	12,134.	2.298	336
1900	6,047.25	1.126	8,241.5	1.56	284
1901	6,506.75	1.232	7,291.25	1.38	315
1902	4,604.	.872	7,255.	1.374	225
1903	6,027.	1.141	10,054.	1.904	297
1904	5,596.	1.059	8,529.5	1.615	284
1905	7,071.	1.339	8,549.	1.619	347
1906	5,847.	1.107	11,101.	2.102	301
	323,653.96	61.27	405,135.24	76.713	15,061

WATER-CART HYDRANTS, 1906.

Aetna,	Near Coral St., 10′ 6″ out from stand pipe.
Austin,	24′ 6″ W. of W. line of Queen St., 11′ 6″ out from stand pipe.
Benefit,	59′ 7″ E. of E. line of Beacon St., 15′ 10″ S. of N. line of St., 26′ 6″ out from stand pipe.
Bloomingdale Rd.	104′ E. of E. line of Grafton St. (S.), 15′ 9″ N. of S. line of St., 22′ out from stand pipe.
" "	7′ 8″ out from stand pipe.
Bowdoin,	13′ E. of E. line of Chestnut St., 5′ N. of stand pipe.
Bridge,	36′ 6″ W. of W. line of viaduct wall (S.), 20′ 4″ out from stand pipe.
Burncoat,	21′ E. of W. line of St., 18′ 9″ N. of N. line of Melville St.
Cambridge,	12′ 6″ S. of N. line of St., 3′ 6″ E. of W. line of Southbridge St.
"	16′ 9″ S. of N. line of St., 25′ E. of E. line of Douglas St.
"	11′ 6″ out from stand pipe.
" cor Douglas	15′ S. of N. line of St., 25′ E. of E. line of Douglas St.
Carroll,	7′ out from stand pipe.
Chandler,	43′ 6″ W. of W. line of Newbury St., 20′ 9″ out from stand pipe.
" n. Park Ave.	30′ W. of W. line of Park Ave., 7′ 3″ out from stand pipe.
" n. Bellevue,	16′ E. of W. line of Wright's new machine shop, 24′ 8″ N. of stand pipe.
Chatham,	75′ 6″ E. of E. line of Houchin Ave., 12′ out from stand pipe.
Commercial,	20′ S. of N. line of Central St., 18′ E. of W. line of Commercial St.
Congress,	51′ 6″ W. of W. line of Crown St., 18′ out from stand pipe.
Crescent,	23′ 8″ out from stand pipe.
Crown,	4′ 4″ out from stand pipe.
Cutler,	6′ 3″ N. of N. line of Union Ave., 18′ 6″ out from stand pipe.
Eastern Ave.,	Near Belmont St., 19′ 10″ out from stand pipe.
E. Central n. Ford	26′ 2″ out from stand pipe.
Elm,	North side, about 100′ W. of Chestnut St., about 12′ E. of elm tree, 9′ 2″ out from stand pipe.
Florence,	8′ 7″ out from stand pipe.
"	25′ N. of N. line of Charlotte St., 16′ E. of W. line of Florence St.
"	20′ 5″ S. of S. line of May St., 26′ 10″ out from stand pipe.
Foster,	12′ 8″ out from stand pipe.
Front,	63′ 7″ W. of W. line of Church St., 64′ N. of stand pipe.
Fruit near Dayton	7′ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

Garden,	54′ 3″ W. of W. line of Lincoln St., 19′ 6″ N. of S. line of Garden St., 23′ 9″ out from stand pipe.
Gold,	E. side, about 30′ S. of catch-basin, S. side of Bradley St., 20′ out from stand pipe.
Grand,	16′ 6″ E. of E. line of Illinois St., 26′ 6″ out from stand pipe, 5′ 9″ out from stand pipe.
" near Douglas,	8′ 10″ out from stand pipe.
Green,	27′ 8″ N. of S. line of Crompton's shop, 14′ 4″ out from stand pipe.
Grove,	49′ S. of S. line of Lexington St., 34′ 3″ out from stand pipe.
"	End of wire mill, 7′ 9″ out from stand pipe.
"	Near North St., 8′ 6″ out from stand pipe.
Hermon,	14′ 4″ from S. line of barn wall on N. W. cor. Southbridge and Hermon Sts., 30′ 2″ W. of
"	E. line of barn, 8′ 10″ S. of stand pipe.
	9′ 6″ S. of N. line of Hermon St., 27′ E. of E. line of Main St.
Highland,	7′ 9″ out from stand pipe.
"	14′ W. of W. line of Boynton St., 10′ 3″ S. of stand pipe.
"	43′ E. of E. line of Westland St., 22′ 9″ out from stand pipe.
"	31′ 6″ out from stand pipe.
"	Near Newton Sq., 32′ 6″ out from stand pipe, 1′ 6″ E. of centre of stand pipe.
	WATER CART HYDRANTS (Continued).
Hollywood,	S. of May St., 6′ 10″ out from stand pipe.
Home,	N. side, front of school-house lot, opp. end of Wesby St., 6′ 8″ out from stand pipe.
Hudson,	59′ 6″ S. of S. line of Elm St., 26′ out from stand pipe.
Institute Rd.,	Near Beechmont St., 3′ 4″ out from stand pipe.
" "	Near West St., 2′ 6″ out from stand pipe.
Jaques Ave.,	W. side, between two trees front of school-house lot, 8′ 6″ out from stand pipe.
King,	17′ W. of W. line of Queen St., 24′ out from stand pipe, ¾″ stop, 17′ 9″ W. of W. line of Queen St., 22′ 3″ out from stand pipe.
"	7′ 10″ out from stand pipe.
Lafayette,	13′ S. of N. line of St., 31′ W. of W. line Quinsigamond Ave., ¾″ stop, 11′ 2″ S. of N. line of St., 32′ W. of W. line Quinsigamond Ave.
Lagrange,	50′ S. of S. line of Beacon St., 20′ out from stand pipe.
Lake,	19′ 9″ out from stand pipe.
Lancaster,	14′ S. of S. line of Institute Rd., 27′ out from stand pipe.
Lincoln,	10′ 9″ N. of N. line of Perkins St., W. of Lincoln St., 14′ out from stand pipe.
Lodi,	4′ 3″ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

Madison,	7′ 2″ W. of W. line of Southbridge St., 22′ 8″ out from stand pipe.
Main,	At Hammond St,. 7′ W. of stand pipe.
"	22′ 9″ W. of E. line of Main St., 35′ N. of N. line of Gertrude Ave.
"	Near Grand St., 34′ N. of N. line of Downing St., 53′ E. of W. line of Main St., 3′ 6″ W. of stand pipe.
"	Opp. Marble St., 9′ 3″ out from stand pipe.
"	Near University Park, 9′ N. of stand pipe, 2′ 10″ out from stand pipe.
"	Near Park St., 25′ S. of stand pipe on branch of two-way hydrant, 1′ 8″ W. of E. line of curb-stone.
"	11′ 7″ N. of N. line of Park St.
Mill,	13′ 6″ N. of N. line of Quinn's Block, 27′ out from stand pipe.
Millbury,	Near the mill, 1′ 9″ W. of stand pipe, 2′ out from stand pipe.
"	Near Seymour St., 10′ W. of E. line of St., 13′ 9″ S. of N. line of Seymour St.
"	Near Greenwood St., 6′ N. of stand pipe.
"	Below the ledge, 2′ 6″ N. of stand pipe.
"	S. of Cambridge St., 13′ 3″ W. of E. line of St. 62′ 9″ N. of N. line of Whitney St.
Merrick,	107′ S. of S. line of Davis Ct., 7′ out from stand pipe.
Mulberry,	15′ E. of W. line of St., 27′ 3″ N. of N. line of Asylum St., 22′ 6″ out from stand pipe.
Newbury,	E. side opp. division fence N. of Austin St., 6′ 9″ out from stand pipe.
Oak Ave.,	18′ 9″ E. of W. line of Ave., 26′ N. of N. line of Belmont St., (W).
Orange,	E. side, near Myrtle St., 6′ S. of electric light pole, 5′ 9″ out from stand pipe.
Orient,	3″ valve 21′ N. of N. line of Hamilton St., 18′ 8″ E. of W. line of Orient st., ¾″ stops 17′ 6″ E. of W. line of St., 22′ 3″ N. of N. line of Hamilton St.
Oxford,	15′ S. of S. line of Pleasant St. 8′ out from stand pipe.
Paine,	Near Perkins St., 8′ out from stand pipe.
"	Near Vinton St., 9′ 6″ out from stand pipe.
Park Ave.,	Box on Lovell St., 28′ 3″ S. of stand pipe, 12′ E. of W. line of Park Ave.
" "	7′ out from stand pipe.
" "	98′ 6″ N. of N. line of house, 194 Park Ave., 18′ 10″ out from stand pipe.
Penn Ave.,	15′ 9″ E. of W. line of Ave., 20′ 4″ S. of S. line of Ave.
Piedmont,	33′ 6″ N. of N line of Brigham St., 22′ out from stand pipe.

WATER-CAR HYDRANTS (*continued*).

Plantation,	13′ 8″ N. of N. line of Shrewsbury St., 9′ 8″ W. of E. stone wall cor. Shrewsbury and Plantation Sts., 26′ 4″ N. W. from stand pipe.
Plum,	30′ S. of S. line of Shrewsbury St., 7′ 7″ out from stand pipe.
Pond,	Cor Harding St., 7′ 9″ out from stand pipe.
Portland,	10′ E. of W. line of Portland St., 2′ S. of stand pipe.
Prescott,	Above wire mill, 9′ 10″ out from stand pipe.
"	Near North St. 21′ out from stand pipe.
"	2′ 6″ out from stand pipe.
Richards,	8′ out from stand pipe.
Salisbury,	18′ 6″ W. of W. line of Dean St., 7′ out from stand pipe.
"	Cor. Park Ave., 8′ 10″ out from stand pipe.
Sheridan,	Box on Shrewsbury St., 27′ N. of S. line of St., 12′ E. of W. line of Sheridan St.
Shrewsbury,	12′ 3″ N. of S. line of Shrewsbury St., 18′ W. of W. line of schoolhouse fence.
Sigel,	66′ 9″ W. of W. line of Harding St.
Southbridge,	Near Prov. & Worc. R. R., 9′ 3″ out from stand pipe.
Southgate,	26′ 9″ W. of W. line of Southbridge St. 24′ 6″ out from stand pipe.
Sturgis,	S. side, opp. greenhouse, about 200′ from Lincoln St., 20′ 5″ out from stand pipe.
Summer,	17′ 3″ E. of W. line of St., 66′ 6″ S. of S. line of Central St.
Sycamore,	S. side in front of school-house lot, 16′ 6″ out from stand pipe.
Temple,	29′ 8″ S. of N. line of St., 22′ 10″ E. of W. line of Jourdan's barn.
Tufts,	W. side, near division fence, N. of No. 2. 7′ out from stand pipe.
Vernon,	21′ 9″ E. of E. line of Richland St., 10′ 6″ out from stand pipe.
Wall,	Near Norfolk St., 26′ out from stand pipe.
Ward,	3′ 6″ out from stand pipe.
"	19′ 6″ W. of W. line of Wade St., 17′ 6″ out from stand pipe.
Washington,	21′ 6″ N. of N. line of Plymouth St., 15′ 10″ W. of E. line of Washington St., ¾″ stop 21′ 6″ N. of N. line of Plymouth St., 17′ 6″ W. of E. line of Plymouth St. 19′ 3″ out from stand pipe.
Water,	8′ 9″ out from stand pipe.
Waverley,	N. side, 6′ E. of third tree, W. of Coral St., 8′ 10″ out from stand pipe.
Westminster,	7′ 6″ out from stand pipe.
William,	7′ out from stand pipe.
"	7′ 3″ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

Windsor,	N. of Harrington Ave., 19′ out from stand pipe.
Winslow,	15′ 9″ S. of S. line of Pleasant St., E. of Winslow St., 22′ out from stand pipe.
Winthrop,	Near Providence St., 6′ 3″ N. of stand pipe.
Woodland,	12′ 10″ N. of S. line of school-house lot, 6′ 10″ out from stand pipe.
"	Near Downing St., 2′ 8″ out from stand pipe.
Wyman,	22′ 9″ S. of S. line of Hollis St., 22′ 9″ out from stand pipe.

CAR SPRINKLING HYDRANTS.

Belmont,	22′ 6″ S. of N. line of street. 36′ W. of W. line of Oak Ave.
Bloomingdale Rd.	At cor. of Putnam Lane.
Boynton,	17′ 4″ E. of W. line of street. 39′ N. of N. line of Highland St.
Burncoat,	14′ 6″ E. of W. line of street, 94′ S. of S. line of engine house..
E. Worcester,	At Shrewsbury St., 3′ 3″ S. of S. line of Shrewsbury St., 14′ 4″ E. of W. line Norcross Bros.' office.
Franklin Sq.,	35′ W. of E. line of Main St., 14′ N. of S. line of Allen Ct.
Fremont,	21′ 6″ S. of N. line of street, 74′ E. of E. line of house No. 22.
Grafton,	22′ N. of S. line of street, 1′ E. of E. line of Houghton St.
"	51′ 4″ W. of E. line of Grafton St., 14′ S. of N. line of Keese St.
Grove,	12′ 10″ W. of E. line of street, 50′ 7″ S. of S. line of No. 328.
Highland,	12′ 4″ S. of N. line of street, 14′ W. of W. line of 162 Highland St.
June,	17′ W. of E. line of June St., 56′ N. of N. line of Chandler St., looking west
Lincoln,	At house No 160.
"	24′ W. of E. line of St., 14′ 2″ S. of N. line of Perkins St.
Main,	16′ 7″ W. of E. line of street, 11′ 3″ N. of N. line of Beaver St.
"	39′ 4″ N. of S. line of St., 88′ W. of W. line of McMullen lot 14.
"	20′ S. of N. line of Main St ., 86′ 6″ E. of E. line of Lake St.
"	31′ N. of S. line of street, 5′ 6″ W. of W. line of ell part of house 1482 Main St.
"	19′ W. of E. line of street, 23′ S. of S. line of Hammond St.
Mill,	18′ W. of E. line of street, 31′ N. of N. line of Main St.
Millbury,	N. of Sigel St., 6″ gate on hydrant will shut this off.
"	26′ W. of E. line of street, 10′ N. of S. line of Maxwell St.
"	11′ 6″ W. of W. line of street, 15′ S. of N. line of Perry St.
Park Ave.,	21′ W. of E. line of Park Ave., 76′ S. of S. line of Fern St.
" "	23′ 8″ W. of E. line of Park Ave., 39′ N. of S. line of Harrington and Richardson's shop.
Pleasant,	15′ S. of N. line of street, 9′ 6″ E. of W. line of 137 Pleasant St.
"	19′ 6″ S. of N. line of street 32′ 9″ W. of W. line of Park Ave.

CAR SPRINKLING HYDRANTS (*continued*).

Pleasant,	20′ S. of N. line of street, 151′ W. of W. line of 414 Pleasant St.
"	3″ valve, 18′ W. of E. line of Pleasant St., 3′ 6″ S. of N. line of Wetherell's farm house.
Providence,	107′ S of N. line of S. pier to Crompton's driveway, 20′ 3″ E. of W. line of Providence St.
Salem,	34′ 6″ S. of S. line of Front St., 26′ 6″ W. of E. line of Salem Sq.
Salisbury,	19′ W. of E. line of St., 23′ 8″ N. of N. line of Lincoln Sq. This gate shuts to the right.
"	3″ valve, 36′ 6″ E. of E. line of Park Ave., 19′ S. of N. line of Salisbury St.
Shrewsbury,	115′ S of N. line of Hunt St., 20′ W. of E. line of Shrewsbury St.
Southbridge,	426′ 6″ S. of N. line of Lafayette St., 17′ 6″ W. of E. line of Southbridge St.
Summer,	17′ E. of W. line of street, 29′ S. of S. line of Prospect St.
Vernon,	18′ 8″ W. of E. line of street, 24′ S. of S. line of Union Ave., looking west.
Washington Sq.,	43′ 6″ W. of W. line of Summer St., 40′ 8″ N. of S. line of Front St.
Webster,	3′ 8″ E. of E. line of street, 9′ 2″ N. of S. line of Jacques St.
W. Boylston,	Near Fair Grounds, 1′ S. of S. rail in centre of turn-out, near Fair Grounds.
" "	Near Huntington Ave. 16′ W. of E. line of W. Boylston St., 52′ S. of S. line of Huntington Ave.

DRINKING FOUNTAINS.

Cambridge Sq.,	On Millbury St., 30′ 4″ W. of E. line of street, 51′ 3″ S. of S. line of Cambridge St.
Franklin Sq.,	14′ 3″ E. of E. line of Scott's block, 20′ 3″ N. of N. line of same,
Front,	Cor. Salem Sq., 65′ 6″ from base of fountain, 42′ 9″ W. of W. line of Church St.
"	Cor. Summer on Summer St., 26′ E. of W. line of street, 8′ 8″ N. of N. line of Front St.
Lincoln Sq.,	Cor. Main St., shut off in sidewalk.
Millbury,	Cor Reeves St., 1′ 6″ W. of W. line of Millbury St., 27′ 9″ S. of N. line of Reeves St.
Plantation cor. Belmont,	15′ E. of W. line of Plantation St., 6′ S. of S. line of Belmont St., 9′ 2″ out from drinking fountain.
Vernon Sq.,	22′ 4″ S. of N. line of Vernon St., 8′ S. of N. line of house 108 Water St. 8′ E. of W. line of Water St.
Webster Sq.,	30′ 9″ N. of S. line of Cambridge St., 25′ 6″ W. of W. line of Webster St.

WATERING TROUGHS.

	WATERING TROUGHS.
Adams Sq.,	20′ W of E. line of Lincoln St., on S. line of Shattuck St.
Belmont,	At Lake, 11′ 6″ S. of S. line of Belmont St., 34′ 7″ E. of W. line of Lake Ave.
Chadwick Sq.,	29′ S. of hydrant, 35′ 6″ E. from watering trough.
Chandler,	10′ 2″ E. of W. line of Bellevue St., 16′ 8″ S. of N. line of Chandler St. W.
"	31′ 6″ N. of S. line of Chandler St., 6′ 9″ E. of W. line of Mill St.
Coes Sq.,	11′ 4″ W. of E. line of St., 19′ N. of N. end of parapet wall, 42′ 10″ S. of S. line Coes' shop 56′ 8″ S of S. line Beaver St.
Grafton,	Cor. Hamilton St., 16′ 5″ S. of N. line of St., 32′ 6″ N. of trough. 100′ 6″ W. of W. line of Orient St.
James,	14′ out from centre of trough, ½ rod stop, 11′ 9″ out from centre of trough.
Lincoln Sq.,	43′ 8″ S. of N. line of Lincoln Sq., 10′ 3″ W. of W. line of Prescott St.
Millbury,	30′ 4″ W. of E. line of St., 51′ 3″ S. of S. line of Cambridge St.
"	At Greenwood St., 26′ 4″ directly E. from trough.
Pleasant,	7′ 3″ out from X on trough near the ground.
Southbridge,	33′ 2″ from W. line of Southbridge St., 28′ S. of S. line of Southgate St.
"	At Madison St., 32′ 9″ out from trough at Madison Sq., 36′ 6″ S. of S. line of No. 114.
"	At Stearns Sq., 6′ 3″ out from trough, 1′ 8″ S. from trough, drip 4′ S. of trough 2′ 6″ W. of E. end of trough.
Vernon Sq.,	On Vernon St. 5′ 6″ above gate box, 6′ 9″ out in direct line from where it enters the trough.
Washington Sq.,	On Shrewsbury St., W. 36′ 6″ S. of N. line of St., 60′ E. of E. line of Summer St.
Webster Sq.,	15′ 9″ W. of W. line of Webster St., 30′ 10″ N. of S. line of Cambridge St.

EXPENDED 1906.

WATER WORKS CONSTRUCTION.

Salary of Commissioner, Geo. W. Batchelder,	$2,100 00	
Pay-rolls, laborers,	17,659 13	
Clerical service,	1,228 43	
Brick and freight on same,	9 50	
Carpentering and lumber,	158 48	
Castings, patterns and fire clay,	1,894 00	
Cordage, waste and packing,	109 34	
Engineers' services and materials,	64 37	
Express, freight and trucking,	757 09	
Fuel,	68 93	
Hack and horse hire,	3 38	
Hardware, tools and repairs,	36 82	
Hydrants, water gates, valves and repairs,	3,019 57	
Inspection of pipe, hydrants and valves,	131 26	
Iron pipe, and freight on same,	13,317 52	
Iron and steel,	94 55	
Lead pipe and lead,	2,299 63	
Meters and repairs,	2,755 50	
Meters and repairs, Union Water Meter Co.,	7,214 60	
Meters taken out,	85 25	
Miscellaneous supplies and expenses,	7 61	
Pipe, fittings, etc.,	2,440 18	
Powder and fuse,	104 35	
Rubber goods,	37 45	
Repairs, sewers,	134 43	
Repairs, streets,	927 49	
Sewer pipe, cement and sand,	96 73	
Special castings for iron pipe,	772 26	
Stone for blocking,	8 51	
Traveling expenses,	2 76	
Putting in meter box,	216 67	
Machinery and repairs,	26 00	
		$57,781 79
Balance November 30, 1905,	$1,909 88	
Transfers,	25,000 00	
Revenue,	31,335 25	
		$58,245 13
Expenditures,		57,781 79
Balance November 30, 1906,		$463 34

PIPE EXTENSION AND IMPROVEMENT.

Payrolls, laborers,	$6,239 65	
Cordage, waste and packing,	29 60	
Engineers' services and materials,	113 14	
Express, freight and trucking,	446 52	
Hydrants, water gates, valves and repairs,	1,480 05	
Inspecting pipe, hydrants and valves,	171 59	
Iron pipe and freight on same,	14,401 08	
Lead pipe, lead and freight on same,	853 46	
Repairs, sewers,	117 54	
Repairs, streets,	166 37	
Sewer pipe, cement and sand,	17	
Special castings for iron pipe,	968 83	
Team work,	12 82	
		$25,000 82
Balance November 30, 1905,	$1.79	
Appropriation,	25,000 00	
		$25,001 79
Expenditures,		$25,000 82
Balance November 30, 1906,		$.97

KETTLE BROOK SUPPLY.

Pay-rolls, laborers,	$47 07	
Engineers' services and materials,	121 86	
Express, freight and trucking,	35 00	
Hardware, tools and repairs,	1 64	
Legal expenses,	10 01	
Sewer pipe, cement and sand,	17	
Team work,	35	
Refreshments,	1 00	
Services of expert,	46 00	
		$263 10
Balance November 30, 1905,	$240 03	
Revenue,	5,906 46	$6,146 49
Expenditures,		263 10
Balance November 30, 1906,		$5,883 39

HOLDEN SUPPLY.

Hardware and tools,	$19 00	
		$19 00
Balance November 30, 1905,	$180 04	
Expenditures,	19 00	
Balance November 30, 1906,		$161 04

ASNEBUMSKIT SUPPLY.

Pay-rolls, laborers,	$10,751 27	
Pay-rolls, team work,	670 54	
Engineers' services and materials,	2,775 22	
Car fares,	215 00	
Hardware, tools and repairs,	2,308 94	
Miscellaneous supplies and expenses,	92 28	
Pipe and fittings,	579 60	
Rubber goods,	87 03	
Board of men and horses,	24 55	
Cordage, waste and packing,	92 36	
Printing,	28 50	
Blacksmithing,	16 25	
Blank books, stationery and stamps,	4 83	
Fuel,	126 86	
Express, freight and trucking,	173 34	
Furniture, fixtures and repairs,	68 80	
Repairs, boilers, engines and machinery,	166 80	
Blankets, harness and repairs,	7 50	
Lumber and telephone poles,	845 44	
Record of waste water,	100 00	
Valves water gates and freight on same,	171 80	
Powder and fuse,	67 63	
Sewer pipe, brick, cement, sand and freight on same,	664 52	
Repairs, building,	7 50	
Wire fence and posts,	181 80	
Engines,	1,997 50	
Iron and steel, and freight on same,	1,036 31	
Stone posts,	10 00	
Derrick,	351 75	
Railroad supplies,	1,302 71	
Paints and oils,	18 30	
Gasolene,	23 46	
		$24,968 39

Balance November 30, 1905,	$43,713 14	
Revenue,	11 80	
		$43,724 94
Expenditures,		24,968 39
Balance November 30, 1906,		$18,756 55

Value of stock and tools on hand November 30, 1906, $129,056.43. Bills have been rendered to the City Treasurer to the number of 2,898, amounting to $31,477.04.

Number of abatements, sixty-nine, amounting to $558.73.

Amount of bills in hands of treasurer, November 30, 1906, $6,682.34.

Amount collected during the year $31,335.25.

Respectfully submitted,

GEORGE W. BATCHELDER,

Water Commissioner.

Report of the Water Registrar.

To the Honorable City Council of the City of Worcester.

GENTLEMEN:—In compliance with Section 11, Chapter 48, of the City Ordinances, the report of the income division of the Water Department for the year ending November 30, 1906, is presented.

Two hundred and ninety-four (294) applications for water were received during the year and placed in the hands of the Water Commissioner.

The following bills were given the treasurer for collection:

For metered water,	27,511 bills,	amounting to	$328,881 51
For annual rates,	485 bills,	amounting to	7,490 62
Total bills,	27,996	Total amount,	$336,372 13

Total amount of revenue received during the year ending November 30, 1906, $328,358.28. Of this amount $999.68 was from uncollected bills in the hands of the treasurer November 30, 1905.

The amount of uncollected bills in the hands of the treasurer November 30, 1906, was $8,219.59. Of this amount $1,480 was for bills against the Worcester Insane Hospital for water taken from unmetered connections in the grounds, $3,034.87 was for bills due from the Parks Department, $1,212.47 from the School Department, and $470.83 from the Sewer Department.

During the year, the sum of $822.68 has been abated owing to changes from annual rates to metered rates, vacant tenements, and adjustment of bills of water takers. $1,992.58 was transferred.

Forty-four services were shut off for non-payment of bills, and, with few exceptions, these bills have been paid and water turned on.

During the past year 4,234 houses have been inspected and 3,046 notices have been sent to owners notifying them of leaks in the water fixtures in their premises.

Financial Statement for the Year Ending November 30, 1906.

RECEIPTS.

For assessments for water, 1905,	$1,087 96	
For assessments for water, 1906,	327,270 32	
Apples,	17 00	
Blacksmithing,	4 32	
Board of horse,	120 00	
Buildings,	15 00	
Hardware and tools,	6 75	
Hay and grain,	418 75	
Lumber,	10 00	
Miscellaneous supplies,	1 55	
Pipe and fittings,	21 98	
Refuse materials and junk,	13 27	
Rent of engine,	120 00	
Rent of machinery,	9 50	
Wages uncalled for,	06	
		$329,116 46

EXPENDITURES.

Amount transferred to interest on water loan,	$145,112 50	
Amount transferred to sinking fund, per order City Council,	750 00	
Amount transferred to Water Dept. (con.), per order City Council,	25,000 00	
Running expenses,	65,683 74	
		$236,546 24
Balance transferred to sinking fund (water bonds),		$92,570 22

Detailed Account of Expenditures.

Salary of Registrar, George C. Hunt,	$1,600 00
Pay-rolls, laborers,	30,252 39
Clerical service,	2,003 89
Service of canvassers,	627 00
Service of meter readers,	5,631 89
Care of reservoirs,	2,064 00
Abatements of water rates,	25 95
Blacksmithing and blacksmiths' supplies,	385 32
Blank books, stationery and stamps,	408 37

Blankets, harness and repairs,	199 88
Boilers and repairs,	19 50
Books and subscriptions,	35 00
Car tickets and transportation of laborers,	449 10
Carpentering and lumber,	346 55
Carts, wagons and repairs,	302 99
Castings, patterns and fire clay,	529 25
Chemical analyses (water samples),	4 00
Cordage, waste and packing,	130 49
Damage caused by bursting pipe,	62 43
Engineers' services and materials,	970 40
Engines, pumps and repairs,	23 40
Express, freight and trucking,	19 04
Fuel,	477 90
Furniture, fixtures and repairs,	52 04
Gas,	205 13
Hack, automobile and horse hire,	442 50
Hardware, tools and repairs,	828 85
Hay, grain and straw,	1,771 67
Horses,	520 00
Hose and couplings,	22 23
Hydrants, water gates, valves and repairs,	342 63
Insurance,	26 95
Iron pipe and freight on same,	44 64
Iron and steel,	205 80
Lead pipe and lead,	124 73
Loam, fertilizer and seeds,	97 60
Medical attendance on horses,	80 25
Meters and repairs,	817 62
Meters and repairs (Union Water Meter Co.),	3,232 63
Miscellaneous supplies and repairs,	314 07
N. E. Telephone & Telegraph Co., rental and service,	58 12
Paints, oils and painting,	189 94
Pipe, fittings, etc.,	341 02
Printing and photographs,	278 40
Refreshments for committee and guests,	175 20
Refreshments for laborers,	44 44
Rent of barn,	104 00
Rent of land for watering trough (B. & A. R. R. Co.),	1 00
Rent of land, Woodward St. (M. J. Whittall),	300 00
Rent of machinery,	2 00

Repair of buildings,	640 29
Repair of fountains,	22 14
Repair of streets,	74 32
Rubber goods,	179 47
Services of expert engineers,	154 50
Sewer pipe, cement and sand,	371 21
Taxes in Holden,	195 98
Taxes in Leicester,	404 61
Taxes in Paxton,	201 29
Team work,	195 89
Traveling expenses,	11 56
Typewriter supplies and repairs,	70 25
Watering streets,	6 36
Annie Scannell, Admrx., injury to person,	9 00
Patrick J. Houlihan, injury to person,	91 00
Services of auctioneer,	25 80
Pay-rolls, laborers (Holden),	4,214 88
Pay-rolls, team work (Holden),	370 24
Pay-rolls, laborers (Kettle Brook),	799 65
Pay-rolls, team work (Kettle Brook),	63 80
Pay-rolls, laborers (Lynde Brook),	386 50
Pay-rolls, team work (Lynde Brook),	2 80
	$65,683 74

REVENUE.

The total amount of revenue received from the collection of water rates during the financial year ending November 30, 1906, was $328, 358.28, the largest in the history of the department, and an increase of $19,970.55 over the preceding year.

1890	$140,293 71	
1891	148,332 04	$8,038 33
1892	164,638 19	16,306 15
1893	185,564 63	20,926 44
1894	185,940 02	375 39
1895	200,255 51	14,315 49
1896	207,295 65	7,040 14
1897	210,064 16	2,769 51
1898	222,006 33	11,942 17
1899	238,462 14	16,455 81
1900	262,175 74	23,713 60
1901	259,429 06	—2,746 68
1902	269,428 64	9,999 58
1903	270,651 66	1,223 02

1904	293,794 02	23,142 36
1905	308,387 73	14,593 71
1906	328,358 28	19,970 55

The quantity of water, in gallons, furnished and charged for during the year enidng November 30, 1906, was as follows:

Domestic purposes,	754,230,174	
Manufacturing purposes,	508,499,199	
Steam and electric railways,	228,965,517	
Elevators,	235,775,137	
Motors,	5,986,172	
Schools,	34,022,054	
Churches,	3,275,478	
Hotels,	18,380,101	
Hospitals,	78,626,554	
Stables,	7,791,385	
Laundries,	33,971,646	
Fire Department houses,	3,012,517	
Sewer Department,	4,281,990	
Street Department,	1,384,337	
Parks,	19,341,759	
Stores, offices, saloons, shops, etc.,	115,359,479	
Unmetered water (estimated),	30,000,000	
		2,082,903,499

The quantity of water, in gallons, furnished during the year and for which no revenue is received, was as follows:

Street sprinkling,	103,420,000	
Merrifield estate,	54,492,075	
Hydrant flushing,	26,129,966	
Urinals,	16,572,000	
Watering troughs and drinking fountains,	43,683,000	
Water Department, for testing meters, etc.,	6,473,573	
Slow meters,	102, 645,174	
Estimated water used in testing sprinkler systems,	1,200,000	
Miscellaneous purposes,	5,228,978	
		359,844,766
Total accounted for,		2,442,748,265

DWELLINGS, PERSONS, FIXTURES, ETC., ASSESSED FOR WATER IN THE CITY OF WORCESTER.

Dwellings,	12,931	Baths,	20,279
Families,	28,269	Water-closets,	36,514
Stores,	1,540	Hose,	10,821
Offices,	1,382	Boilers,	3,081
Saloons,	106	Horses,	5,447
Markets,	112	Cows and oxen,	857
Shops,	601	Elevators,	426
Stables,	2,346	Barber shops,	156
Persons using,	136,582	Hotels,	34
Sinks,	35,067	Schools,	79
Basins,	22,275	Motors,	49

The number of new meters set during the year was 383, making the total number now in use 14,466.

KINDS.	SIZES.										
	5/8″	3/4″	1″	1¼″	2″	3″	4″	6″	8″	10″	Total
B. & F. Piston	358	39			5						402
Columbia.....	1										1
Crown.....	7	2									9
Desper.....	187	9									196
Duplex.....	1										1
Empire.....	1										1
Gem.....	1		1		1	4	10	9		3	29
Hersey.....	730	47	3	1	2		1				784
" detector							3	4			7
" disc.....	1676		1	3							1680
Keystone.....	2										2
King.....	170										170
Lambert.....	20										20
Nash.....	86										86
Thomson.....								1			1
Torrent.....			1		11	2	2	3			19
Trident.....	182	2									184
Union Rotary.	9607	465	244	183	227	104	21	6	1		10,858
Worthington..	16										16
Total.....	13,045	564	250	187	246	110	37	23	1	3	14,466

During the year, 171 Hersey, 213 Hersey disc, 17 King, 2 Lambert, 8 Nash, 3 B. & F. Piston, 2,163 Union Rotary, 4 Torrent, 22 Trident meters have been taken off for repairs. Most of them have been repaired at the department shop without cost to the owner. Total cost of repairs, $8,285.26.

Table showing the monthly and the average daily consumption of water, in gallons, for the fiscal year:

MONTH.	Consumption per month.	Average monthly consumption	Average daily consumption for the month	Average daily consumption for the year.
December....	279,452,800		9,014,606	
January.....	287,508,760		9,274,476	
February	261,306,320		9,332,368	
March.....	287,224,520		9,265,307	
April	284,030,560		9,467,685	
May	589,879,920		9,350,965	
June.....	277,627,680		9,254,256	
July	275,608,080		8,890,583	
August	290,298,800		9,364,478	
September....	279,146,120		9,304,871	
October.....	279,063,840		9,002,059	
November....	272,608,600		9,086,953	
		280,313,000		9,217,384

The maximum consumption for one day amounted to 11,982,960 gallons, and the average daily consumption per consumer for the year was 68.98 gallons.

Table showing the yearly, daily, and per capita consumption of water in gallons for the past ten years:

	Yearly consumption.	Average Daily consumption.	Per capita daily consumption.
1897	2,220,629,280	6,083,916	58.6
1898	2,480,385,988	6,795,578	64.1
1899	2,785,836,000	7,632,428	68.9
1900	2,975,716,025	8,152,373	72.
1901	3,290,031,620	9,013,785	77.6
1902	2,997,335,636	8,211,878	68.8
1903	3,535,818,440	9,687,173	79.2
1904	3,739,925,200	10,218,374	83.7
1905	3,517,396,800	9,636,703	76.
1906	3,363,756,000	9,217,384	68.98

Water metered and accounted for during the past ten years.

	Total Metered.	Total Accounted For.	Per Cent of Total Metered.	Per Cent of Total Accounted For.
1897	1,140,498,225	1,211,744,975	51.3	54.5
1898	1,246,347,086	1,306,696,336	50.2	52.6
1899	1,362,278,941	1,467,419,741	48.9	52.3
1900	1,489,290,945	1,614,622,045	50.4	54.2
1901	1,519,770,438	1,640,019,938	46.1	49.8
1902	1,580,824,913	1,700,922,413	52.7	56.7
1903	1,620,727,639	1,748,753,629	45.8	49.4
1904	1,758,092,526	1,883,290,526	47.	50.3
1905	1,881,254,205	2,163,797,405	54.3	61.5
1906	2,052,903,499	2,442,748,265	61.	72.6

STATISTICS OF CONSUMPTION OF WATER.

1.	Total population (water census),	138,891
2.	Population on line of pipe (water census),	136,582
3.	Population supplied (water census),	136,582
4.	Total consumption for the year,	3,363,756,000
5.	Passed through meters,	2,082,903,499
6.	Percentage of consumption metered,	61
7.	Average daily consumption,	9,217,384
8.	Gallons per day to each inhabitant,	66
9.	Gallons per day to each consumer,	68.98
10.	Gallons per day to each tap,	373
11.	Cost of suplying water per million gallons figured on total maintenance expenses,	$26.95
12.	Cost of supplying water per million gallons figured on total maintenance plus interest on bonds,	$70.09

Remarks.

A brief recapitulation of the results attained by this department during the past year may be of interest.

The total revenue received from the sale of water for the fiscal year ending November 30, 1906, was $328,358.28, an increase of $19,970.55 over the previous year. If department bills amounting to $4,718.17 had been paid as usual before the end of the fiscal year, the total revenue would have been $333,076.45. The total increase in the amount of revenue received in the past three years amounts to $57,706.62, an average increase of $19,235.54 per year. It is very gratifying to state that, notwithstanding this unusually large increase in the amount of revenue received, the total consumption of water has been very much reduced. The total consumption of water during the year 1904 was 3,739,925,200 gallons, in 1905, 3,517,396,800 gallons, and in 1906, 3,363,756,000 gallons, a reduction of 376,169,200 gallons in two years. I think the above remarkable showing demonstrates the fact that a much larger per cent of the water used is being paid for and that the waste has been reduced to a minimum. As the result of this decreased consumption, together with an increase in the number of inhabitants, the average daily per capita consumption has been reduced from 83.7 gallons in 1904 to 68.98 gallons in 1906. This is much less than the average per capita consumption in most of the large cities in the country.

Meters.

The financial success of this department depends largely upon the accuracy of the meters. 383 new meters were set during the year, making the total of 14,466 meters in use at the present time. These meters after being in use for several years become worn to such an extent that a large per cent. of the water passes through them without being registered. For this reason it is important that a frequent examination of these meters be made and, when necessary, taken off and repaired. During the past year, 2603 of these defective meters have been removed by the department, repaired, and replaced at an expense of $8,285.26.

Census.

In 1905 the population of the city of Worcester, according to the State census, was 128,135. The water census taken about the same time by the department officials showed a population of 132,550, a difference of 4,415 in favor of the water census. There was some doubt expressed at that time as to the accuracy of the water cen-

sus, but I am very glad to say that the result of the census taken this year under almost exactly similar conditions verifies the accuracy of that census. The population of the city of Worcester for the year 1906, as returned by the census enumerators, who are permanent meter readers of this department, is 138,891.

Recommendations.

On December 21, 1900, the following amendment to the tariff of water rates was adopted by the City Council:

Ordered:—That the tariff of water rates heretofore existing and in use in the city of Worcester and adopted by the City Council in the year 1887, be and the same is hereby amended by adding to the paragraph in said tariff, entitled "Metered Water" at the end thereof, the following:—For any quantity of water used exclusively for manufacturing purposes and charged directly to and paid by such manufacturing consumer ten cents ($.10) per thousand gallons.

This reduction in rate has been a great assistance to most manufacturers, but it discriminates against a class of manufacturers who are in need of, and should be entitled to this low rate. Under a strict interpretation of the above order your Water Registrar is not allowed to grant the ten cent rate to manufacturers who sub-let a part of their factory to other manufacturers and furnish them with power. This seems to be manifestly unfair to these small manufacturers and has caused this department a great deal of trouble. I, therefore, respectfully recommend that the above order be amended by striking out the words "and charged directly to and paid by such manufacturing consumer." If this amendment is adopted, it will allow the Water Registrar to charge all manufacturers at the rate of ten cents per thousand gallons for water used exclusively for manufacturing purposes.

I desire to express my appreciation to those connected with this department for the faithful and efficient service rendered during the past year.

Respectfully submitted,

GEO. C. HUNT,

Water Registrar.

Report of City Engineer.

CITY ENGINEER'S OFFICE, Dec. 14, 1906.

To the Honorable City Council of the City of Worcester.

GENTLEMEN: I have the honor to submit the following report for the Engineering Department for the year ending November 30, 1906, as follows:

STREETS.

In accordance with orders of the City Council, and preparatory to further action thereon, decrees were prepared for the laying out and making public of streets, with a total length of two and seven-tenths (2.7) miles. Decrees were also prepared for the establishment of sidewalks on twenty-two (22) streets, with a total length of two and sixteen hundredths (2.16) miles, a list of which is exhibited in the following tables:

STREETS LOCATED FROM DECEMBER 1, 1905, TO DECEMBER 1, 1906.

Street.	From.	To	Width Feet.	Length. Feet.	Date of Decree.	Remarks.
Albany	Casco	E. Worcester	50	1400.00		
Branch	Wall	Orient	40	431.07		On File.
Barber Ave	Fairview Ter.	Barber Ave. E.	50	672.81		"
Batchelder	Union Ave.	Winthrop	40	585.80	Oct. 8, '06.	
Cambridge				201.58	Dec. 3, '06.	Relocat'n N. Side.
Camp	Cambridge	Southgate	40	878.16		
Caroline	Grafton	Plantation	40	574.66		On File.
Fairmont Av.	Hamilton	Grafton	40 to 50	1826.06		"
Fairview Ter.	W. Boylston	Easterly	40	900.58	Dec. 3, '06.	
Fiske	Hadwen Road	Chandler	50	1045.07		
Forbes	Windsor	Channing	40	271.83	Dec. 3, '06.	
Hadwen Road	June	Fiske	50	370.62		
Lincoln	Boylston	Easterly		368.40	Dec. 26, '05.	Relocation N. Side.
Oread Place	Main	Northerly	30	380.39	Dec. 3, '06.	
Perkins	Windsor	Channing	40	271.83		On File.
Richland	Millbury	Ward	40	401.08		On File.
Shrewsbury	E. Central	Adams	100	3475.42	June 25, '06.	Relocation
Wesby	John	Home	30	245.28	Dec. 3, '06.	
Total				14,300.64		

Gradient and sectional stakes were set for the construction and pavement of the following list of streets:

Street.	From	To	Length, Feet.	Remarks.
Ames	Vernon	So. Easterly	578.03	
Ashton	Washington ave.	Lincoln ave	425.28	
Blithewood ave.			300.00	
Bloomingdale rd.	B.&A.freight house	Suffolk	593.15	Hassam pavement
Boynton	Highland	Salisbury	1423.00	" "
Canterbury	Grand	Southerly	389.00	
Colton	Southbridge	D	945.15	Macadam
Columbus	Lovell	Circuit ave E.	612.70	
Dryden	Edgeworth	Hemans	524.90	
Elm ave.	Pleasant	Midland	299.88	
Gage	East Shelby	Elliott	554.26	
Grand View ave.	Main	Stafford	1926.39	
Hemans	Dryden	Whittier	837.82	
Holland road	Main	Northerly	778.40	Macadam
Howe	Fruit	Sever	274.10	Macadam
Isabella	Englewood ave.	Circuit ave	588.90	
Lincoln	Boylston	Easterly	368.40	
Litchfield	So. Crystal	Hacker	940.22	Macadam
Main	Wellington	Hammond	2487.00	Block paving
May	Pleasant	Southerly	920.54	
Millbury	Sigel	Ballard	5742.90	Block paving
Millbury	Middle River	N.Y.N.H.&H.R.R.	128.60	Block paving
North ave.	B. & M. R. R.	Barber ave	300.00	
Shrewsbury	Adams	Belmont	2494.00	Macadam
Southbridge	Madison	Hammond	2290.00	Block paving
Vassar	Amherst	Cornell	483.76	
West Boylston	Barber ave.	Fales	3000.00	
Winthrop	Providence	Heywood	600.00	Macadam
Young	Main	Stafford	411.00	Reloc. grade
Total length			31,217.38	

Decrees for the establishment of sidewalk grades, preparatory to further action by the City Council, were provided for the following named streets:

Street.	From	To	Date of Decree.	Length in Feet.	Side.
Ames	Vernon	Easterly	July 9, '06	1155.40	Both sides
Channing	Hermitage L.	Forbes	July 9, '06	450.00	West
Cheever	Chelsea	Woodward	Nov. 12, '06	535.60	North
Elm Av.	Pleasant	Midland	Nov. 12, '06	301.40	South
Englewood Av.	Lovell	Hobson Av.	Nov. 12, '06	365.00	N. East
HarringtonAv.	Westminster	Windsor	Nov. 12, '06	475.10	North
Harrison	Providence	Coral	Dec. 26, '05	277.50	East
Hathaway	Gardner	Hancock	July 9, '06	260.70	North
Heywood	Granite	Jones	June 4, '06	643.60	South
Holland Road	Main	Northerly	April 2, '06	400.00	West
Hollis	Gardner	Wyman	July 9, '06	478.50	North
Hunt'gton Av.	W. Boylston	Tower	July 9, '06	500.00	North
June	Chandler	May	May 14, '06	773.00	East
Lincoln	Lincoln Av.	Brittan Lane	Dec. 26, '05	450.00	East
"	Shaffner	Southerly	July 9, '06	88.30	East
Mason	Chandler	Tufts	On file	93.70	North
Mass. Av.	Salisbury	Metcalf	July 9 ,'06	512.00	West
Oliver	Park Av.	Florence	July 9, '06	898.13	East
Park Av.	Fairfield	Maywood	July 9, '06	456.00	N. West
"	Highland	Russell	July 9, '06	786.00	East
Tufts	Mason	Park Av.	On file	811.30	North
Westminster	Harringt'n Av.	Forest Av.	Sept. 11, '06	702.40	West
Total length				11,408.63	

For the setting of curbstones, gradient and alignment stakes were placed on the following streets:

Street.	From	To	Length. Feet.	Remarks.
Bloomingdale rd.	B. & A. R. R.	Easterly	129.80	South side, reset
Beeching			230.20	West side, extension
Boynton	Highland	Salisbury	1388.40	East side, reset
Canterbury	So. Crystal	Northerly	200.00	West side, reset
Caro	College	Southerly	250.00	East side, reset
Eastern ave		Prospect	559.62	S. East side, extension
Florence	Downing	Charlotte	358.60	N. West side
Florence	May	Charlotte	1147.40	East side
Foster	Main	Easterly	75.00	South side, reset
Harrington ave	Westminster	Windsor	475.10	North side
Harrison	Providence	Coral	277.50	South side
Hathaway	Gardner	Hancock	260.70	North side
Hermon	Main	Beason	553.75	West side, reset
Holland rd.	Main	Northerly	400.00	West side
Hollis	Gardner	Wyman	478.50	North side
Home	Wesby	No. Ashland	391.50	South side, reset
June	Chandler	Northerly	389.00	West side, reset
June	Chandler	May	778.00	East side
Lincoln	Shattuck	Shaffner	264.80	East side
Loudon	Main	Woodland	478.50	West side
Main	Wellington	Hammond	4372.00	Both sides
Main	Foster	Southerly	82.50	East side, reset
Millbury	Sigel	Ballard	4512.00	East side, reset
Mulberry	Fulton	Asylum	241.00	West side
Newbury	Pleasant	Chatham	485.70	East side, reset
Oliver	Woodbine	Southerly	132.85	East side
Park ave	Highland	Russell	796.10	East side
Park ave	Fairfield	Maywood	456.00	N. West side
Pleasant			100.00	North side
Prospect	Eastern ave	Westerly	150.00	North side
Shaffner	Uxbridge	Easterly	160.50	South side
Shrewsbury	Adams	Belmont	7776.00	Both sides
Shrewsbury	E. Central	Adams	6152.40	Both sides
Southbridge	Madison	Hammond	3345.90	Both sides, reset
So. Crystal	Canterbury	B. & A. R. R.	127.90	North side
Upsala	Vernon	Easterly	1100.00	North side
Webster			107.20	East side
Westminster	Harrington av.	Forest ave	702.40	West side
Windsor	Perkins	Forbes	225.74	East side
Windsor	Mt. Vernon	Perkins	509.30	West side
Woodland	Maywood	Downing	782.00	South side
Woodland	Hawthorne	Easterly	174.50	South side
Total length			41,543.36	

For renumbering the following named streets by the City Council, surveys and plans were made and notices sent to the owners and occupants, in accordance with the orders therefor:

Street.	From	To	Length, Feet.	
Bloomingdale	Grafton	Easterly	8618.16	
Columbus	Lovell	Circuit Ave	612.70	
Everard	Belmont	Breck	1640.80	
Florence	May	Beaver	2868.00	
Fobes			957.65	
Holden	Grove	Holden Line	8741.70	
Union Ave	Ward	Grafton	4085.98	
Waconah Road	Whitman Road	Park Ave	546.40	
Total Length			28,071.39	

Summary of street work for various purposes:

Street bounds set,	104	
Street bounds reset,	67	
Line and grade given on application,	173	
Locations examined and approved for electric light conduits,	23	
Locations examined and approved for telegraph conduits,	13	
Locations examined and approved for telephone conduits,	75	
Locations examined and approved for gas pipes,	34	
Locations examined and approved for water pipes,	15	
Number of surveys to determine wall encroachments,	1	
Number of surveys for improvement of surface drainage,	3	
Number of surveys for book of plans,		1
Cross sections for grades, and estimates of cost of construction,	8	

Eighteen (18) plans of street locations were made and filed and duplicates furnished for recording.

Plans were made and supervision and other assistance given to the Street Department in the reconstruction of the Grove Street bridge. The lateness of the season preventing the completion of the deck, which should be carried out upon the advent of seasonable weather.

Attention is again requested to the need of similar work at the Burnett Street bridge, crossing Kettle Brook, the existing structure being in an unsafe condition. Several other short span bridges within the city limits, which are unsatisfactory in form and usefulness, could with profit be replaced by more modern construction.

Sewers.

Sewer construction has called for the usual preparation of plans, and general assistance incident to the work, which is fully set forth in the report of the superintendent of that department.

3.072 miles of sewers in the aggregate were built during the year. House drains to the number of 422, with a total length of 3.40 miles, were inspected and gradients given therefor. Twenty-eight (28) plans, with duplicates, were made for sewerage construction, filing and recording.

WATER.

In co-operation with the Water Department a beginning was made in the development of the Asnebumskit supply by the erection, in part, of the headworks and canal designed to divert the main stream into the Kendall pond, so-called. A small force of men were employed, and the work only sufficiently advanced to safeguard its construction, and permit of undertaking further work in the coming spring without serious interference from water. At the same rate of advance, probably another season will be required to complete the work. Should this be followed by the building of the proposed conduit through the Tatnuck Brook divide, means will then have been provided to make use of the waters of this source should occasion require. I believe it to be the part of good judgment to continue this work in a moderate way, and as the revenues of the Water Department will warrant. Earlier in the season a special report upon the possibilities of this source of supply was made to the City Council.

In previous annual reports recommendation has been made that small street mains in various parts of the city be replaced with pipes of more generous capacity. Many of the pipes to which allusion was made were put down many years ago, and in size and condition are totally unfit for the requirements of today. Their usefulness as a fire protection are small, while the property values which have grown up about them are important. The number of streets containing water pipes of this character are by far too many, and should not be allowed to continue in their present state until some example of their insufficiency draws attention to their weakness. I feel it the part of duty to again ask the consideration of the Council to this matter, and to urge that a measure of such vital interest be given their attention.

Of equal or even greater import is the necessity of a new main from the Tatnuck Brook reservoir. The present pipe was laid in the year 1883, and in size and capacity is insufficient for the demands put upon it today. About one-half of the present supply of water is drawn from this source, and with any considerable number of fire streams added to the ordinary domestic consumption, its service is poor and without sufficient pressure. The importance of this source of supply is constantly increasing, and as the draft multiplies, the value of the line as a protection against fire is diminished. I am of the opinion that to safeguard the city against hazard by fire, that this main should at least be equal to any ordinary demands of the city without assistance from the Parson's Brook line. I respectfully ask your attention to this matter.

The several reservoirs of the water system are for the most part in excellent condition. Their state of repletion has been much above the average throughout the year, by reason of the generous rainfall during the spring and early summer months.

MISCELLANEOUS.

The surveys of a miscellaneous nature are as follows:

Levels to establish grade on private streets with a total length of 1355 feet, 2

Grade crossings.

Surveys and levels for decrees at various crossings.

Public Buildings Department:

Surveys of estates, batters and levels, location of fire limits, and paving at engine house (School Street), 7.

Health Department:

Isolation Hospital levels for additions.

Hope Cemetery:

Measurements of lots.

Parks Commission:

Surveys for establishment of boundaries.

Grove Street bridge:

Surveys, levels and batters for construction.

Burnett Street bridge:

Surveys and levels in preparation of new bridge.

Assessors' Department:

Survey for books of plans together with maps and excerpts of deeds.

Worcester Consolidated Street Railway Company:

Line and grade for extension and changing of tracks, Channing, Foster, Main, Shrewsbury, Southbridge and West Boylston streets.

Indian Lake:

Cross-section of dam.

Wilder's gravel pit:

Grade stakes and cross-section for estimate of amount of material removed.

Lake Avenue:

Survey and plan showing encroachments.

Bell Pond:

Survey of division line adjoining city property.

Sutton Lane bridge:

Measurement of timber required for reflooring.

Survey to determine the variation of magnetic needle.

Total number of plans made by the department for all purposes, is 208.

The co-operation of this department relative to the abolition of grade crossings has added very materially to its service.

Acknowledgement is due to my assistants for their co-operation and faithful service, and which I am glad to commend.

Respectfully submitted,

FREDERICK A. McCLURE,

City Engineer.

ANNUAL REPORT

OF THE

Water Commissioner

the Water Registrar and the City Engineer

OF THE

CITY OF WORCESTER



ANNUAL REPORT

OF THE

WATER COMMISSIONER,

THE WATER REGISTRAR, AND THE

CITY ENGINEER

OF THE

CITY OF WORCESTER

FOR THE

YEAR ENDING NOVEMBER 30, 1907.

Worcester, Mass.
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WATER COMMITTEE, 1907.

Alderman JOHN P. HOLMGREN, *Chairman,*
Alderman MARK L. PATTERSON,
Alderman JOHN H. CONNELLY,
Councilman FREDERICK H. LUCKE,
Councilman FREDERICK MIDGLEY,
Councilman JOHN W. HARRINGTON,
Councilman GERALD F. McGILLICUDDY.

WATER COMMISSIONER.

GEORGE W. BATCHELDER.

WATER REGISTRAR.

GEORGE C. HUNT.

REPORT OF THE WATER COMMISSIONER.

To the Honorable City Council of the City of Worcester.

Gentlemen:—In compliance with Section 4, Chapter 48 of the City Ordinances, the report of the Water Commissioner for the year ending Nov. 30, 1907, is respectfully presented.

CONSTRUCTION.

The department has been busily engaged in laying main pipes during the past year.

An unusually large number of petitions for water pipes have been presented to the City Council, and have all been viewed by the Water Committee.

While all the petitions have not been granted, the most urgent ones have been favorably acted on, and in nearly every instance the pipes have been laid, or will be before work is abandoned for the winter.

The very rapid growth of the city is shown nowhere more plainly than in the constantly increasing number of petitions for extensions of water pipes, and the department favors a liberal policy in the treatment of these requests.

Several important pipe improvement orders have been filled.

The 20-inch low service main laid from Chandler street through Oxford, Chatham, Crown, Pleasant and West to Elm streets has immensely improved the fire service in the section through which it runs.

The 12-inch main in North Foster street, from Commercial street to Union street, is another valuable addition to the pipe system.

The 24-inch main in Park avenue, from Grove street to Pratt court, connecting with the main running from Pratt court to Salisbury street in Park avenue, is another very important piece of work performed.

This very materially strengthens the line running through Salisbury, Forest, Grove and Holden streets, and will prevent a recurrence of the difficulty experienced by the Fire Department in getting water at the Highland Military Academy fire last spring.

The necessity for continuing the laying of large mains in place of small ones is apparent to anybody who studies the situation, with a knowledge of the present pipe system.

This matter is especially important in sections where the land is crowded with high and expensive buildings, which is the condition now coming about in the center of the city.

Details of construction work for the past year will be found in another part of this report.

Reservoirs.

The several reservoirs have been looked after, and the shores and surroundings kept in proper condition.

The work of ditching swamps has been continued and is now going on.

The farms located on the water sheds are regularly looked after to see that no conditions exist which would be of possible danger to the water supply.

Supply.

At no time during the year has the supply of water in storage been reduced to a point which would cause any alarm.

The rainfall has been heavy, especially during the months of September and October, and the draft has been kept at a low rate per capita.

Since the installation of meters on fire pipes, the draft of water has been well under control; the department has received pay for a much larger amount of its product and the rate per capita has been reduced each year.

The quality of the water has been uniformly good, with the exception of a few weeks in mid-summer, when a vegetable taste was noticeable in the waters of Holden reservoir No. 1.

This taste soon disappeared when the amount of water in storage was increased by the rains in September.

It is believed that work which is being carried on in swamps near Holden Reservoir will reduce the unpleasant taste which sometimes appears at periods of low water.

The department faces the winter with reservoirs completely filled.

New Supply.

Work has been continued in a small way on the dam and gate house at Asnebumskit Brook, and has been abandoned for the winter.

Recommendations.

That work on Asnebumskit be continued each year in such a degree as the finances of this department will permit.

That pipe improvement be continued at an expenditure of not less than $25,000 each year, and in this connection it may be said that an expenditure of $50,000 a year for five years would not put the system in advance of where it should be.

The attention of the City Council is called to the size of the main pipe from Holden Reservoir.

This pipe is 30 inches in diameter from the reservoir to the junction of Chandler and Mill streets, where it reduces to 24 inches, and is totally inadequate to supply the low service system under ordinary conditions, without assistance from Parsons Reservoir.

It is recommended that a new 48-inch pipe be laid from Holden Reservoir toward the city so far as the finances will permit.

Your attention is also called to the insufficient size of the high service mains from Lynde Brook Reservoir, with a recommendation that a new 36-inch main be started at the reservoir and run as far as funds will permit.

No long term loans for laying water pipes will be asked for during the year 1908.

It has been found difficult to start the laying of water pipes in the early spring with a full force of men, because funds

are not available from the water revenue at such an early date.

This frequently results in serious delay in putting in necessary water pipes, and in some cases has been known to retard building operations.

It would greatly facilitate the work of this department if some means were devised whereby the construction work could be advanced without waiting for the water revenue.

Finances.

The finances of the department are in good shape.

All of the estimates made at the beginning of the year have proven correct, and the department has accomplished what it said it could at that time.

The revenue for 1907 shows a large increase over 1906, but will not for a long time show any great surplus if the money is used to put the system in proper condition.

Conclusion.

The cordial support given this department by the Water Committee has been an inspiration to give the best service possible.

The active co-operation and assistance of the workers have been of great value in the results shown, and appreciation is hereby shown.

Summary of Statistics.

Dates of construction: 1845, 1864, 1883, 1895, 1896, 1900, 1901, 1902, 1903, 1904, 1906, 1907.

Source of supply: Impounding reservoirs in the towns of Leicester, Paxton and Holden.

Mode of supply: Gravity.

Capacity of reservoirs: 2,549,827,789 gallons.

Average pressure: High service, 150 pounds. Low service, 70 pounds.

Number of miles main pipe, 2 inches to 40 inches diameter, 202.43.

Number of miles service pipe, 140.786.
Number of fire hydrants, 2,051.
Number of water gates, 2,907.
Number of water meters, 14,775.
Total cost of works to date, Dec. 1, 1907, $4,495,333.09.
Thirty-nine fire hydrants have been set during the year.
The total number now in service for fire protection is 2,051.
Of this number 207 are on the premises of individuals and corporations.
Number of water cart hydrants in use, 137.
Number of car sprinkling hydrants in use, 41.
Number of drinking fountains in use, 11.
Number of watering troughs in use, 18.
Elevation of reservoirs above Main street at City Hall:

KETTLE BROOK RESERVOIR NO. 1.

Rollway 364.36 feet.

KETTLE BROOK RESERVOIR NO. 2.

Rollway 507.5 feet.

KETTLE BROOK RESERVOIR NO. 3.

Rollway 559.00 feet.

KETTLE BROOK RESERVOIR NO. 4.

Rollway 601.74 feet.

LYNDE BROOK RESERVOIR.

Rollway 341.94 feet.

PARSONS RESERVOIR.

Rollway 237.80 feet.

HOLDEN STORAGE RESERVOIR NO. 1.

Rollway 269.88 feet.

HOLDEN RESERVOIR NO. 2.

Rollway 237.80 feet.

HOLDEN DISTRIBUTING RESERVOIR.

Rollway 177.00 feet.

Elevation of Main street at City Hall above tide-water, 481 feet.

Water pressure at City Hall, low service, 70 pounds.

Water pressure at City Hall, high service, 150 pounds.

In addition to the service pipes, which are reported in tabulated form, there have been fifty-two changed, for which 862 feet of pipe was used in the streets, and 1,438 feet on the premises of the owners.

Three thousand, four hundred and twenty (3,420) feet of temporary mains have been laid, the persons thus supplied paying the expense of trenching and laying and for pipe exceeding 100 feet.

The following tables will show rainfall at the reservoirs, sizes of pipe laid, also number of gates and hydrants set during the year:

TABLE

Showing the daily height of water in KETTLE BROOK NO. 2 RESERVOIR for year ending November 30, 1907.

Date.	DECEMBER.	JANUARY.	FEBRUARY.	MARCH.	APRIL.	MAY.	JUNE.	JULY.	AUGUST.	SEPTEMBER.	OCTOBER.	NOVEMBER.
1	20.40	19.90	21.42	21.65	21.53	21.45	21.43	21.45	21.38	13.55	15.40	19.05
2	20.42	20.07	21.45	21.55	21.50	21.43	21.45	21.43	21.37	13.63	15.43	19.10
3	20.40	20.15	21.47	21.48	21.50	21.43	21.52	21.40	21.38	13.58	15.45	19.73
4	20.55	20.30	21.50	21.43	21.51	21.40	21.52	21.37	21.40	13.50	15.50	19.20
5	20.62	20.52	21.47	21.43	21.51	21.48	21.50	21.37	21.38	13.53	15.65	20.05
6	20.48	20.60	21.45	21.43	21.50	21.48	21.53	21.37	21.38	13.70	15.67	20.17
7	20.50	20.65	21.45	21.43	21.47	21.48	21.50	21.37	21.37	13.63	15.70	21.80
8	20.50	20.77	21.43	21.43	21.47	21.45	21.47	21.37	21.35	13.60	16.10	21.53
9	20.35	20.85	21.43	21.43	21.50	21.47	21.45	21.35	21.35	13.75	17.20	21.53
10	20.20	20.90	21.43	21.43	21.52	21.45	21.43	21.35	21.35	14.05	17.45	21.52
11	19.95	20.95	21.43	21.43	21.50	21.47	21.43	21.33	21.33	14.30	17.55	21.54
12	19.78	21.00	21.43	21.43	21.50	21.45	21.40	21.40	21.32	14.63	17.60	21.47
13	19.60	21.03	21.43	21.44	21.53	21.45	21.40	21.42	21.30	14.50	17.65	21.45
14	19.60	21.08	21.43	21.46	21.53	21.43	21.38	21.40	21.28	14.37	17.70	21.45
15	19.65	21.12	21.45	21.47	21.53	21.42	21.38	21.37	21.22	14.32	17.73	21.45
16	20.30	21.15	21.43	21.46	21.55	21.40	21.37	21.35	20.80	14.25	17.75	21.45
17	21.05	21.18	21.43	21.46	21.55	21.58	21.35	21.35	20.50	14.30	17.75	21.45
18	21.27	21.23	21.43	21.48	21.50	21.53	21.35	21.43	20.85	14.05	17.78	21.45
19	21.00	21.27	21.43	21.46	21.47	21.50	21.35	21.40	21.15	13.95	17.80	21.47
20	20.83	21.38	21.43	21.46	21.49	21.50	21.34	21.38	18.90	13.90	17.83	21.45
21	21.00	21.45	21.43	21.43	21.47	21.45	21.35	21.52	16.85	14.30	17.90	21.45
22	21.05	21.43	21.43	21.45	21.45	21.45	21.34	21.53	16.74	14.35	18.00	21.47
23	20.60	21.43	21.42	21.48	21.45	21.43	21.34	21.60	16.74	14.45	18.03	21.45
24	19.70	21.42	21.42	21.67	21.57	21.43	21.34	21.60	16.75	14.67	18.07	21.45
25	19.38	21.43	21.42	21.60	21.53	21.43	21.33	21.50	16.15	14.75	18.10	21.57
26	19.05	21.43	21.42	21.54	21.50	21.43	21.33	21.48	15.75	14.78	18.12	21.50
27	19.00	21.43	21.52	21.56	21.50	21.46	21.34	21.45	15.05	14.80	18.15	21.47
28	19.20	21.42	21.63	21.57	21.45	21.53	21.30	21.45	14.05	14.82	18.20	21.45
29	19.13	21.42		21.62	21.47	21.48	21.30	21.52	13.68	15.20	18.75	21.47
30	19.20	21.42		21.62	21.45	21.45	21.47	21.45	13.60	15.35	18.90	21.47
31	19.25	21.42		21.55		21.45		21.40	13.53		19.00	

The depth of water is shown in feet and decimals of a foot. Height of rollway 21.34 feet.

TABLE

Showing the daily height of water in KETTLE BROOK NO. 3 RESERVOIR for year ending November 30, 1907.

Date.	DECEMBER.	JANUARY.	FEBRUARY.	MARCH.	APRIL.	MAY.	JUNE.	JULY.	AUGUST.	SEPTEMBER.	OCTOBER.	NOVEMBER.
1	26.27	22.83	26.00	26.35	26.15	26.10	26.03	26.07	26.00	13.45	18.10	24.60
2	26.30	23.18	26.03	26.20	26.12	26.08	26.05	26.05	25.98	13.45	18.15	24.70
3	26.32	23.26	26.05	26.09	26.12	26.07	26.17	26.03	26.00	12.63	18.20	25.50
4	26.32	23.50	26.10	26.03	26.14	26.07	26.17	26.01	26.01	12.65	18.35	25.85
5	26.30	23.95	26.07	26.03	26.14	26.10	26.13	26.01	26.00	12.68	18.60	25.98
6	26.20	24.05	26.05	26.03	26.12	26.08	26.15	26.00	26.00	13.63	18.65	26.07
7	26.18	24.17	26.03	26.03	26.09	26.08	26.12	26.00	26.00	14.07	18.77	26.35
8	26.16	24.40	26.03	26.03	26.09	26.05	26.10	26.00	25.98	14.55	19.20	26.15
9	26.12	24.60	26.03	26.03	26.12	26.08	26.07	25.98	25.98	14.90	20.70	26.13
10	26.12	24.70	26.04	26.03	26.14	26.05	26.05	25.98	25.98	14.95	20.90	26.13
11	26.14	24.73	26.04	26.03	26.12	26.08	26.05	25.95	25.96	15.05	21.05	26.15
12	26.18	24.75	26.04	26.04	26.12	26.05	26.03	26.01	25.95	15.00	21.15	26.10
13	26.15	24.85	26.03	26.05	26.15	26.05	26.03	26.03	25.93	13.55	21.25	26.07
14	26.16	24.95	26.03	26.08	26.15	26.03	26.02	26.01	25.93	12.75	21.35	26.07
15	26.15	25.03	26.05	26.10	26.15	26.03	26.02	26.00	25.90	12.57	21.40	26.05
16	26.38	25.10	26.03	26.08	26.18	26.03	26.02	25.98	25.90	13.40	21.47	26.05
17	26.35	25.13	26.03	26.08	26.18	26.22	26.02	25.98	24.55	13.43	21.52	26.05
18	25.80	25.18	26.03	26 13	26.15	26.15	26.02	26.05	23.10	13.95	21 58	26.05
19	25.40	25.23	26.03	26.08	26.12	26.10	26.02	26.03	21.90	14.10	21.65	26.08
20	25.00	25.45	26.03	26.08	26.14	26.10	26.01	26.01	21.40	14.10	21.70	26.05
21	24.35	25.65	26.03	26.06	26.10	26.05	26.02	26.13	21.05	14.30	21.80	26.05
22	24.00	25.70	26.02	26.08	26.08	26.05	26.01	26.15	19.85	14.33	21.95	26.07
23	23.73	25.75	26.02	26.13	26.08	26.03	26.01	26.21	18.85	14.65	22.30	26.05
24	23.35	25.80	26.02	26.32	26.18	26.03	26.01	26.21	17.20	16.50	22.65	26.05
25	23.25	25.85	26.02	26.23	26.15	26.03	26.00	26.10	16.15	16.83	23.03	26.20
26	23.20	25 88	26.02	26.20	26.13	26.03	26.00	26.08	15.45	16.90	23.10	26.10
27	23.00	25.90	26.18	26.20	26.13	26.07	26.01	26.06	14.45	16.95	23.15	26.07
28	22.33	25.93	26.32	26.20	26.12	26.15	25.95	26.06	13.50	17.00	23.25	26.05
29	21.85	25.96		26.23	26.12	26.10	25.95	26.15	13.35	17.60	24.05	26.07
30	21.93	25.98		26.22	26.10	26.05	26.10	26.07	13.50	17.95	24.37	26.07
31	22.05	26.00		26.17		26.05		26.03	13.15		24.47	

The depth of water is shown in feet and decimals of a foot. Height of rollway 26 feet.

TABLE

Showing the daily height of water in KETTLE BROOK NO. 4 RESERVOIR and rainfall for year ending November 30, 1907.

Date.	DECEMBER.		JANUARY.		FEBRUARY		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall	Water.	Rainfall.	Water.	Rainfall.
1	27.23		24.57	.15	26.70	.05	26.72		27.90	.32	27.80	.09	27.78		27.78	.07	26.54		25.00		20.43		23.43	
2	26.85		24.77		26.73	.04	26.40		27.85	.09	27.78		27.80	.86	27.76		26.54		24.75	.16	20.45		23.50	
3	26.50	.21	24.85	.16	26.77	.03	26.45		27.85		27.75		27.86	.66	27.75		26.54	.23	24.78	.33	20.47		24.05	
4	26.25		25.00	.31	26.80		26.48	.01	27.87		27.75	.36	27.85		27.74		26.55	.45	24.67	1.46	20.60		24.40	2.35
5	25.95		25.15		26.83		26.49		27.87	.18	27.80	.05	27.83		27.74		26.55		24.60	.62	20.73		24.52	
6	25.80	.78	25.27		26.85		26.49		27.85		27.82	.25	27.85	.40	27.73	.09	26.54		24.15		20.77	.35	24.65	1.84
7	25.72		25.37		26.87		26.50		27.82		27.82		27.83		27.74		26.53		23.78		20.80	.52	25.65	.69
8	25.64		25.50	.06	26.88	.87	26.50	.06	27.82		27.80	.05	27.80	.25	27.73		26.52		23.35	.18	21.23	.85	25.95	
9	25.48	.10	25.60	.34	26.90		26.51		27.85	.66	27.82		27.80	.08	27.73		26.50		23.15	.27	21.80	2.95	26.07	
10	25.35	.26	25.65		26.93		26.54	.06	27.87	.16	27.80	.03	27.80	.03	27.73		26.48		22.90	.04	21.95		26.18	.50
11	25.20	.18	25.68		26.95		26.53	.05	27.85		27.83	.48	27.80		27.72		26.46		22.95	.39	22.03		26.40	
12	24.00		25.70		26.97	.53	26.55		27.85		27.80		27.78		27.75		26.45		22.25		22.10	.04	26.50	
13	23.90		25.75		27.00		26.58	.16	27.87	.19	27.80		27.78		27.76		26.45		22.25		22.17		26.57	
14	23.80		25.80	.59	27.03		26.65	.41	27.87		27.75		27.75		27.75		26.43		22.12		22.23		26.65	
15	23.75	.26	25.87		27.05		26.82		27.87		27.75		27.75		27.74		26.38		21.78		22.27		26.70	
16	23.68		25.93		27.06		26.92		27.90		27.75	.79	27.75		27.73		26.37		21.45		22.30		26.75	
17	23.48		25.97		27.07		27.10		27.90	.04	27.90	.50	27.75		27.73	.22	26.36	.20	21.10		22.32		26.80	
18	23.43		26.00		27.08		27.35		27.85		27.85		27.75		27.76	.24	26.35		20.75		22.35		26.85	
19	23.45		26.03	.34	27.09	.23	27.47	.15	27.83	.08	27.80		27.75		27.75		26.34		20.28		22.37		26.93	.29
20	23.45	.12	26.13	.04	27.10		27.60	.22	27.85		27.80	.23	27.74		27.74		26.32		20.00		22.40	.29	26.95	
21	23.55	.19	26.33		27.11		27.67		27.83		27.78		27.75		27.65	.75	26.30	.05	19.75		22.50		27.00	
22	23.58		26.35	.20	27.11		27.76		27.80		27.75		27.74		27.45		26.30		19.40	.52	22.53		27.06	
23	23.65	.24	26.38		27.12		27.88		27.80		27.75		27.74		27.15		26.28		19.20	.70	22.45		27.12	
24	23.68		26.42		27.12	.05	27.97		27.92	.85	27.75		27.74		26.90		26.25		19.55	2.90	22.37		27.20	
25	23.70		26.45	.34	27.13	.47	27.92	.36	27.88		27.75		27.73		26.90	.23	26.25	.14	19.67	.22	22.30		27.35	1.28
26	23.73		26.48	.75	27.14		27.85		27.85		27.75	.21	27.73	.07	26.88	.26	26.24		19.70		22.35		27.55	
27	23.75		26.53		27.10		27.90		27.85		27.80	.97	27.74		26.85		26.22		19.72		22.38		27.67	.10
28	23.77		26.60		27.00		27.90		27.80	.04	27.87	.03	27.70		26.78		26.20	.10	19.73		22.45	1.79	27.74	
29	23.82		26.63				27.95		27.82	.04	27.83		27.70		26.65		25.95		20.15	2.00	23.03		27.80	
30	23.90		26.65	.04			27.95		27.80	.05	27.80		27.80	1.73	26.58		25.65	.14	20 33	.70	23.30	.89	27.80	
31	23.97	1.34	26.67				27.92				27.80	.04			26.58		25.48	.18			23.38			
	Totals	3.68		3.32		2.27		1.48		2.70		4.08		4.08		1.86		1.49		10.49		7.68		7.05

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 27.74 feet.
Rainfall for year ending November 30, 1907, 50.18 inches.

TABLE

Showing the daily height of water in HOLDEN NO. 1 RESERVOIR and rainfall for year ending November 30, 1907.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	26.55		28.25	.09	29.35	.20	27.98		30.18	.20	31.06	.05	31.28		31.23		29.45		27.13		28.20		30.21	
2	26.64		28.60		29.35	.08	27.96	.36	30.13	.07	31.06		31.29	.67	31.22	.04	29.36	.31	26.96	.15	28.22		30.21	.35
3	26.55	.24	28.80		29.38	.07	27.96		30.14		31.08		31.61	.33	31.23		29.33		26.95	.24	28.22		30.63	1.05
4	26.51		29.01	.51	29.38		27.92	.02	30.16		31.15	.34	31.64		31.11		29.23	.47	27.02	1.33	28.29	.73	30.35	
5	26.51		29.41		29.42	.92	27.88		30.18	.12	31.27		31.58	.39	31.08		29.19		27.01	.78	28.48		30.30	
6	26.51	.68	29.65		29.44	.05	27.85				31.26	.11	31.58	.10	31.02	.14	29.05	.01	27.02		28.53	.01	30.28	2.00
7	26.60		29.80		29.36		27.81		30.15		31.40	.11	31.44		30.97		29.01		26.99		28.46	.06	30.83	.24
8	26.71		30.04	.34	29.33		27.76	.04	30.17	.18	31.15		31.45		30.96		28.95		26.93	.15	28.73	2.30	30.40	
9	26.71		30.22	.03	29.12		27.70		30.25	.56	31.17	.09	31.47		30.87		28.82		26.98	.39	30.02		30.30	
10	26.73	.38	30.21		28.97	.11	27.67		30.21	1.03	31.26		31.44	.12	30.78		28.75		26.90	.02	30.25		30.27	.40
11	26.77	.18	30.25		28.86		27.65	.18			31.33	.46	31.46	.05	30.67	.78	28.60		26.83	.59	30.27		30.29	
12	26.76		30.20	.37	28.73		27.61		30.20		31.51		31.42		30.73	.32	28.53		26.96	.49	30.33	.09	30.23	
13	26.79		30.20	.03	28.59		27.56	.12	30.27	.07	31.45		31.40		30.76		28.45		26.98		30.26		30.22	
14	26.81		30.21	.35	28.40		27.60	.36	30.29		31.50		31.42		30.66		28.35		26.91		30.23		30.18	
15	26.81	.22	30.18		28.42		27.72	.36	30.30		31.37		31.40		30.60		28.25		26.88		30.22		30.17	
16	26.93		30.17		28.42		27.82	.02	30.32		31.37	.30	31.36		30.55		28.12		26.80		30.19		30.15	
17	27.01		30.17	.13	28.37		27.91				31.61	.60	31.35		30.45		28.02	.12	26.83		30.21		30.14	
18	27.05		30.13		28.38		28.25		30.26		31.59		31.36		30.45	.62	27.93		26.79		30.17		30.12	
19	27.09		29.82		28.36	.20	28.54		30.26	.09	31.49	.03	31.23		30.31		27.84		26.78		30.16		30.23	.26
20	27.08		29.48	.32	28.33		28.77	.30	30.30		31.55	.14	31.21		30.28		27.73		26.76		30.14	.50	30.15	
21	27.13	.22	29.38		28.28	.17	28.92		30.15		31.63		31.22	.06	30.33	.61	27.63	.03	26.74	.56	30.23		30.13	
22	27.16		29.19	.23	28.26		29.08		30.13		31.47		31.18	.32	30.26		27.54		26.70		30.15		30.23	.14
23	27.25	.44	29.20		28.25		29.45		30.16		31.45		31.18		30.23		27.44	.09	26.68	.54	30.18	.18	30.23	
24	27.27	.02	29.23		28.22		29.99			.86	31.37		31.19		30.15		27.37	.05	27.33	3.08	30.16		30.19	
25	27.33	.07	29.27		28.19	.48	30.23	.25	30.51		31.43		31.08		30.15	.29	27.36		27.53		30.13			1.28
26	27.36		29.31	.81	28.13		30.21		30.60	.07	31.41		31.13	.06	30.02	.27	27.33		27.43		30.13		30.34	
27	27.39		29.33		28.08		30.20		30.73		31.47	1.13					27.27		27.40		30.12		30.30	.06
28	27.41		29.34		28.02		30.21	.19	30.79	.06		.10	31.03		29.85		27.25	.07	27.37		30.17	1.31	30.21	
29	27.44		29.35				30.23		30.83				30.93		29.79		27.24		27.69	2.16	30.48	.71	30.23	
30	27.49		29.36	.05			30.16		30.93		31.23	.05	31.12	1.38	29.65		27.23	.18	28.11				30.15	
31	27.56	1.36	29.35				30.17				31.29				29.58		27.18	.17			30.22			
	Totals	3.81		3.26		2.28		2.20		3.31		3.51		3.48		3.07		1.50		10.48		5.89		5.78

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 30.10 feet.
Rainfall for year ending November 30, 1907, 48.57 inches.

TABLE

Showing the daily height of water in HOLDEN NO. 2 RESERVOIR and the rainfall for year ending November 30, 1907.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	38.36		38.59	.09	38.84	.20	38.84		38.98	.20	38.95	.05	39.92		39.36		38.58		37.58		37.41		38.89	
2	38.36		38.65		38.84	.08	38.85	.36	38.86	.07	38.92		39.91	.67	39.25	.04	38.55	.31	37.53	.15	37.30		38.87	.35
3	38.37	.24	38.61		38.84	.07	38.85		38.90		38.87		40.10	.33	39.20		38.53		37.48	.24	37.23		39.33	1.05
4	38.42		38.63	.51	38.84		38.85	.02	38.93		38.83	.34	39.98		39.08		38.55	.47	37.61	1.33	37.26	.73	39.06	
5	38.41		38.77		38.85	.92	38.84		38.96	.12	38.91		40.03	.39	38.98		38.61		37.65	.78	37.30		39.02	
6	38.41	.68	38.77		38.86	.05	38.84		38.93		38.89	.11	39.98	.10	38.92	.14	38.59	.01	37.68		37.32	.01	38.98	2.00
7	38.53		38.78		38.85		38.84		38.90		38.91	.11	39.96		38.89		38.57		37.58		37.31	.06	39.58	.24
8	38.50		38.80	.34	38.85		38.84	.04	38.93	.18	39.55		40.02		38.93		38.55		37.53	.15	37.42	2.30	39.13	
9	38.48		38.89	.03	38.84		38.84		38.97	.56	39.66	.09	40.02		38.91		38.53		37.53	.39	37.72		39.00	
10	38.47	.38	38.88		38.85	.11	38.84		38.97	1.03	39.60		40.21	.12	38.88		38.51		37.47	.02	37.87		38.86	.40
11	38.53	.18	38.93		38.85		38.84	.18	38.97		39.61	.46	40.19	.05	38.85	.78	38.49		37.46	.59	38.22		38.93	
12	38.52		38.90	.37	38.84		38.84		38.96		39.67		40.12		38.93	.32	38.50		37.58	.49	38.61	.09	38.84	
13	38.48		38.93	.03	38.84		38.81	.12	38.99	.07	39.64		40.07		39.03		38.48		37.58		38.92		38.88	
14	38.45		38.93	.35	38.84		38.86	.36	38.91		39.66		40.10		38.94		38.45		37.50		38.96		38.90	
15	38.42	.22	38.93		38.85		38.72	.36	39.01		39.79		40.13		39.02		38.41		37.44		38.90		38.71	
16	38.48		38.90		38.85		38.78	.02	38.97		39.83	.30	40.06		39.02		38.35		37.40		38.87		38.74	
17	38.49		38.96	.13	38.85		38.82		38.99		39.99	.60	40.13		38.99		38.31	.12	37.33		38.89		38.75	
18	38.49		38.90		38.85		38.83		38.97		39.99		40.11		39.02	.62	38.32		37.23		38.92		38.76	
19	38.43		39.03		38.84	.20	38.73		38.95	.09	40.13	.03	40.09		39.01		38.33		37.14		38.83		38.81	.26
20	38.43		38.97	.32	38.84		38.78	.30	39.18		40.11	.14	40.01		38.93		38.30		37.06		38.82	.50	38.74	
21	38.45	.22	38.95		38.85	.17	38.77		39.59		39.98		39.99	.06	38.94	.61	38.27	.03	36.97	.56	38.89		38.76	
22	38.47		38.89	.23	38.85		38.76		39.64		40.21		39.88	.32	38.86		38.23		36.95		38.83		38.74	.14
23	38.49	.44	38.83		38.84		38.80		39.69		40.13		39.83		38.77		38.21	.09	36.98	.54	38.86	.18	38.79	
24	38.50	.02	38.84		38.86		38.86		39.81	.86	40.10		39.81		38.63		38.18	.05	37.33	3.08	38.83		38.81	
25	38.45	.07	38.85		38.89	.48	38.95	.25	39.19		40.09		39.73		38.60	.29	38.16		37.33		38.77		38.83	1.28
26	38.43		38.89	.81	38.85		38.93		39.03	.07	40.12		39.63	.06	38.58	.27	38.08		37.28		38.83		38.72	
27	38.35		38.86		38.85		38.92		39.00		40.19	1.13	39.57		38.66		37.98		37.15		38.78		38.76	.06
28	38.32		38.85		38.85		38.93	.19	38.95	.06	40.32	.10	39.41		38.64		37.91	.07	37.10		38.83	1.31	38.52	
29	38.25		38.84				38.96		38.98		40.17		39.29		38.63		37.78		37.30	2.16	39.12	.71	38.43	
30	38.22		38.84	.05			38.90		38.95		39.93	.05	39.37	1.38	38.59		37.72	.18	37.37		38.93		38.65	
31	38.26	1.36	38.84				38.96				39.96				38.59		37.65	.17			38.80			
	Totals	3.81		3.26		2.28		2.30		3.31		3.51		3.48		3.07		1.50		10.48		5.89		5.78

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 38.76 feet.
Rainfall for the year ending November 30, 1907, 48.57 inches.

TABLE

Showing the daily height of water in LYNDE BROOK RESERVOIR and rainfall for year ending November 30, 1907.

Date.	DECEMBER.		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.	Water.	Rainfall.
1	28.18		33.65	1.39	33.43	.05	31.93		36.69	.21	36.65		37.65		35.80		33.22		33.51		36.99		36.90	
2	28.53		34.01		33.35	.09	32.08	.34	36.87	.10	36.51		37.63		35.84		33.01	.16	33.63		36.95		36.88	.33
3	28.88	.15	34.04		33.27		31.99		36.89		36.55		37.87	1.08	35.81		32.89	.13	33.80	.70	36.74		37.32	1.08
4	29.17		34.05	.32	33.23		32.01	.08	36.93		36.53	.35	37.90		35.66		32.72	.45	34.06	1.53	36.72	.58	37.66	
5	29.45		34.29		33.30	.64	31.95		37.05	.12	36.63		38.00		35.51		32.63		34.17	.49	36.70		37.67	
6	29.66	.82	34.33		33.28	.11	31.81		37.07		36.66		38.12	.46	35.32		32.46		34.32		36.66		37.66	1.54
7	30.01		34.34		33.20		31.68		37.00		36.74	.10	38.16		35.28	.07	32.25		34.35		36.59	.02	38.51	1.03
8	30.23		34.37	.33	33.16		31.55	.06	37.01		36.77		38.15		35.06		32.10		34.41	.08	36.58	2.17	38.14	
9	30.33	.03	34.43	.03	33.14		31.39		37.03	.81	36.78	.05	38.04		35.03		31.93		34.62	.23	37.42		37.95	
10	30.58	.14	34.38		33.08	.10	31.28		37.06	.99	36.80		38.08	.14	34.83		31.72		34.74	.01	37.44		37.88	.36
11	30.80	.38	34.32		33.00		31.29	.18	37.00		36.86	.54	38.02		34.65		31.50		34.80	.61	37.39		37.83	
12	30.96		34.21	.32	32.90		31.16		36.97		36.96		37.94		34.63	.95	31.32		35.05	.32	37.37		37.73	
13	31.07		34.18		32.79		31.04	.14	37.01	.10	36.97		37.83		34.49		31.16		35.24		37.35		37.56	
14	31.20		34.13	.18	32.72		31.02	.24	37.04		37.00		37.81		34.34		30.89		35.41		37.29		37.32	
15	31.31	.17	34.07	.07	32.62		31.15		37.14		36.92		37.77		34.26		30.66		35.43		37.20		37.01	
16	31.54		33.97		32.53		31.37		37.15		36.87		37.70		34.04		30.60		35.46		37.10		37.30	
17	31.74		33.90	.12	32.46		31.64		37.19		37.02	.75	37.61		33.96		30.84	.04	35.51		37.02		37.22	
18	31.92		33.82		32.37		32.03		37.12		37.29		37.43		33.83	.59	31.21		35.53		36.92		37.12	
19	32.14		33.71		32.22	.16	32.64		37.09	.03	37.42		37.28		33.81		31.57		35.63		36.80		37.11	.23
20	32.26		33.75	.36	32.12		32.99	.25	37.05		37.53	.18	37.16		33.73		31.84		35.68		36.71	.16	37.10	
21	32.34	.29	34.08		32.10	.18	33.16		37.01		37.57		37.07	.03	33.66	.39	32.15		35.70		36.63	.25	37.02	.04
22	32.37		34.12		31.00		33.40		36.96		37.52		36.87	.16	33.65		32.25		35.89	.95	36.54		36.99	.07
23	32.61	.49	34.12	.24	31.90		33.69		36.88		37.45		36.84		33.62		32.46		36.07	1.98	36.42		36.96	
24	32.68		34.06		31.84		34.26		36.89	.88	37.37		36.65		33.77		32.67		36.88	1.58	36.40		36.88	
25	32.74		33.98		31.86	.45	34.86	.28	36.93		37.26		36.50		33.81	.41	32.72	.13	36.95		36.41		37.00	1.61
26	32.80		33.95	.87	31.73		35.13		36.89		37.19		36.35		33.70	.27	32.94		36.96		36.36		37.16	
27	32.83		33.90		31.64		35.30		36.85	.02	37.16	.46	36.14	.06	33.69		33.03		36.82		36.32		37.22	
28	32.88		33.86		31.52		35.53	.17	36.77		37.53	.51	36.01		33.60		33.15	.03	36.66		36.15	1.30	37.24	
29	32.93		33.72				35.92		36.76	.03	37.70		35.72		33.55		33.25		36.77	2.08	36.57	.60	37.28	
30	32.89		33.60	.03			36.26		36.69		37.72		35.92	1.69	33.42		33.34	.12	37.00		36.93		37.21	
31	32.87	.23	33.49				36.48				37.73	.05			33.31		33.44				36.91			
	Totals	2.70		4.26		1.78		1.74		3.29		2.99		3.62		2.68		1.06		10.56		5.08		6.29

The rainfall is shown in inches and decimals of an inch. The depth of water is shown in feet and decimals of a foot. Height of rollway 37.40 feet.
Rainfall for the year ending November 30, 1907, 46.05 inches.

LENGTH AND SIZE OF PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1907.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		SIZE IN INCHES.	LENGTH IN FEET.			
Adolph	From Olga avenue, easterly	6	240		1	High
Anderson avenue	" Hamilton street, southerly	2	250			High
Bedford avenue	" end of pipe, easterly	8	200			High
Blithewood avenue	" Millbury avenue, easterly	2	2,584			High
Caroline avenue	" Belmont street, southerly	2	508			High
Clinton avenue	" Central avenue, westerly	2	306			High
Dartmouth	" Almont avenue, easterly	2	592			High
Denmark	" Washington avenue, northerly	2	430			High
Dustin	" end of pipe, southerly	2	58			High
Eames road	" Stanley road, westerly	2	231			High
Eureka	" Main street, southerly	8	657	1	1	High
Forsberg	" Greenwood street, westerly	8	997	1	1	High
Frank	" Belmont street, southerly	2	760			High
Fraternal avenue	" Watson avenue, southerly	8	110			High
Gage	" Berkeley street to Eastern avenue	12	965	2	2	High
Gates avenue	" Plantation street, southerly	2	197			Low
Greenwood avenue	" end of pipe, easterly	8	250			High
Hamilton	" end of pipe, easterly	2	700			High
Hillside	" end of pipe, westerly	6	99			High
Hope avenue	" end of pipe at Trowbridge circuit, easterly	2	635			Low
March	Between Orient and Plantation streets	8	656	1	2	High
Marie avenue	From end of pipe, westerly and southerly	12	304		1	High
Marion avenue	" end of pipe, westerly	8	150			High
Millbury avenue	" Julien avenue, southerly	6	53	5	3	High
		8	172			
		10	3,462			High
		16	428			
May	" end of pipe, southerly	2	1,012			High
Nelson place	" Holden street, westerly	6	600	1	1	High
New Bond	" end of pipe, westerly	16	222	1		High
Olga avenue	" Belmont street, northerly	8	330	1	1	High
Otsego road	" Forest street, easterly	6	400	1		High
Park avenue	" end of pipe at Grove street, southerly	24	830		1	High
Pleasant	" Chandler street, westerly	12	1,012	2	2	High

LENGTH AND SIZE OF PIPE LAID DURING THE YEAR ENDING NOVEMBER 30, 1907.—CONTINUED.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		SIZE IN INCHES.	LENGTH IN FEET.			
Rena	From end of pipe, southerly	2	92			High
South avenue	" North avenue, westerly	2	112	1		High
		6	500			
Stanley road	" Clinton avenue, northerly	2	581			High
Stanton	" Belmont street, northerly	8	987	2	2	High
Stebbins	" Millbury street, westerly	8	107	1	1	High
		12	1,117			
Sterling	" Harlem street, northerly	2	198			High
Stockholm	Between Whipple and Tatman streets	8	1,022	2	2	High
Thorne	" Orient and Plantation streets	8	524	1	2	High
Washington avenue	From Uxbridge to Denmark street	2	227			High
West Lake	" Lake street, westerly	2	237			Low
Wigwam avenue	" Dustin street, westerly	2	200			High
Wilkinson	" Fraternal avenue, easterly	6	300	1	1	High
Wilkinson	" end of eight-inch pipe, easterly	2	300			High
Winter	" Grafton street to Harding street	8	334	1	1	High
			27,238	25	25	

LENGTH AND SIZE OF PIPE RELAID DURING THE YEAR ENDING NOVEMBER 30, 1907.

STREET.	LOCATION.	PIPE.		HYDRANTS.	GATES.	SERVICE.
		SIZE IN INCHES.	LENGTH IN FEET.			
Bradley	Between Gold street court and Gold street	10	484	1	3	Low
Chatham	" Oxford street and Crown street	20	340			Low
Crown	" Pleasant street and Chatham street	20	495	1	2	Low
North Foster	" Union street and Commercial street	12	339	1	1	Low
Oxford	" Chandler street and Chatham street	20	720	1	5	Low
West	" Pleasant street and Elm street	20	580		3	Low
			2,958	4	14	

Location, Size and Kind of Hydrants Located During the Year Ending November 30, 1907.

Street.	Location.	Kind.	Size.	Size of Connection.	Size of Outlets.	No. of Outlets.	Size of Street Main.	Lbs. Pressure.	Service.
Bradley	On N. side of street, at W. end of Wyman & Gordon's shop	Mathews	8	8	2-2½" [noz. 1-4½	Steam. 3 [noz.	10	85	Low
Crown	" W. side of street, 26' S. of S. line of Pleasant street	"	8	8	2-2½ [noz. 1-4½	Steam. 3	20	48	"
Eureka	" W. side of street, opposite house Nos. 14-16	"	8	8	2½	2	8	105	High
Forsberg	" E. line of house lot No. 25, on N. side of street	"	6	6	2½	2	8	125	"
Gage	" S. W. corner of Ford and Gage streets.	"	8	8	2½	4	12	115	"
"	" N. side of street, 70' 6" E. of W. line of school house lot	"	6	6	2½	2 [noz.	12	110	"
Gold	" N. side of street, at E. end of F. E. Reed's Foundry	"	8	8	2-2½ [noz. 1-4½	Steam. 3 [noz.	16	85	Low
"	" N. side of street, at W. end of F. E. Reed's Foundry	"	8	8	2-2½ [noz. 1-4½	Steam. 3	16	85	"
March	" N. W. corner Plantation street	"	8	8	2½	2	8	55	High
Millbury avenue	" S. E. corner of Millbury and Blithewoods avenues	"	6	6	2½	2	10	105	"
" "	" E. side of street, N. line of lot house No. 281	"	6	6	2½	2	10	110	"
" "	" E. side of street, N. line of lot house No. 315	Florence	6	6	2½	2	10	125	"
" "	" E. side of street, opposite C. S. Hosmer's house	"	6	6	2½	2	10	135	"
" "	" E. side of street, near N. line of Fred Midgley's barn	"	6	6	2½	2	10	140	"
Mulberry	" N. W. corner of Shrewsbury street	Mathews	8	8	2½	4	16	145	"
"	" E. side of Mulberry street, 15' N. of N. line of Fulton street	"	8	8	2½	4	16	145	"
"	" N. W. corner Mulberry and Asylum streets	"	8	8	2½	4	16	140	"
Nelson place	" N. side of street, 21' E. of E. line of house No. 2	"	8	8	2½	2	6	75	"
New Bond	" S. side of street, near W. line of Norton Grinding Co. shop	"	8	8	2½	4 [noz.	16	115	"
North Foster	" N. side of street, near W. line of Nos. 31-33	"	8	8	2-2½ [noz. 1-4½	Steam. 3	12	82	Low
Olga avenue	" W. side of street, opposite Adolph street	Chapman	8	8	2½	2	8	25	High
Oswald	" S. W. corner Stebbins and Oswald streets	Mathews	8	8	2½	2	8	105	"
Otsego road	" N. side of street at E. side of driveway to Potter's house	"	8	8	2½	2	6	90	"
Oxford	" W. side of street, on W. line of lot house No. 39	Chapman	6	6	2½	2	20	55	Low
Pleasant	" N. side of street, opposite Maple avenue	Mathews	8	8	2½	2	12	95	High
"	" N. side of street, 180' E. of E. line of Carr's house	"	8	8	2½	2	12	90	"
South avenue	" W. side of street, at 1st angle, 70' N. of N. line of house No. 4	"	8	8	2½	2	6	80	"
Stafford	" N. side of street, opposite driveway to Gould's Box Shop	"	8	8	2½	4	16	55	Low
Stanton	" N. W. corner Belmont and Stanton streets	Florence	8	8	2½	2	8	40	High
"	" W. side of street, 104' N. of N. line of house No. 12	"	8	8	2½	2	8	10	"
Stebbins	" N. side of street, on W. line of lot of house No. 12	"	8	8	2½	2	8	135	"
Stockholm	" E. side of street, on N. line of house lot No. 13	Mathews	8	8	2½	2	8	95	"
"	" N. E. corner Tatman and Stockholm streets	"	8	8	2½	2	8	95	"
Thenius	" S. W. corner Stebbins and Thenius streets	"	8	8	2½	2	8	120	"
Thorne	" N. side of street, 30' W. of E. line of Sister's building	"	8	8	2½	2	8	85	"
Wilkinson	" N. side of street, on E. line of Mr. Peterson's lot	"	8	8	2½	2	6	85	"
Winter	" S. E. corner Harding and Winter streets	Chapman	8	8	2½	4	8	140	"
	Private Hydrants.								
High	Boston Store, in yard off High street, rear of store house	Chapman	6	6	2½	2	6	112	High
New Bond	Norton Grinding Co., in yard, S. W. end	Mathews	8	8	2½	2	8	115	"

HYDRANTS CHANGED AND REPLACED BY OTHERS DURING YEAR ENDING NOVEMBER 30, 1907.

No.	STREET.	LOCATION.	KIND TAKEN OUT.	KIND RESET.
4	Austin	On S. W. corner Oxford street	6″-2 way, Chapman	Steamer nozzle 8″-3 way, Mathews
3	Bradley	" N. W. corner Gold street court	4″-2 " "	Steamer nozzle 8″-3 way, Mathews
2	Crown	" N. W. corner Congress street	4″-2 " "	8″-2 " "
3	Institute road	Opposite E. line Lee street	6″-3 " "	6″-2 " Chapman
2	Oxford	On S. W. corner Oxford and Chatham streets	4″-2 " "	6″-2 " "
2	Park avenue	" N. W. corner Pratt court	4″-2 " "	8″-4 " Mathews
2	Pitt	4′ N. of N. line of Sherman street	6″-2 " Mathews	6″-2 " Chapman
1	Weldon avenue	On N. W. corner	8″-2 " Florence	6″-2 " Florence
1	West	" E. side of street, opposite Cottage street	6″-2 " Chapman	8″-2 " Mathews
2	West	" N. E. corner Elm street	6″-2 " "	Steamer nozzle 8″-3 " Mathews

TOTAL LENGTH AND SIZE OF PIPE LAID, AND NUMBER OF GATES AND HYDRANTS IN USE NOVEMBER 30, 1907.

	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	40″	Miles.	Hydrants.	Gates.
Prior to 1907,	19,077	98	76,289	255,298	220,393	24,858	182,705	14,331	139,018	2,717	29,520	30,028	25,113	6,134	15,743	197.22	2,012	2,868
Laid in 1907,	10,210			2,192	6,496	3,946	3,737		650		2,135	830				5.718	39	39
Total,	29,287	98	76,289	257,490	226,889	28,804	186,442	14,331	139,668	2,717	31,655	30,858	25,113	6,134	15,743	202.938		
Pipe taken up in 1907,			284	907	1,440											.5		
Total feet,	29,287	98	76,005	256,583	225,449	28,804	186,442	14,331	139,668	2,717	31,655	30,858	25,113	6,134	15,743		2,051	2,907
Total miles,	5.55	.018	14.394	48.595	42.698	5.455	35.31	2.714	26.452	.514	5.995	5.844	4.756	1.161	2.98	202.438		

Service Pipes Laid to November 30, 1907.

	In the Street.		Premises of Individuals.		No.
	Feet.	Miles.	Feet.	Miles.	
Prior to 1887	171,603.36	32.498	188,386.48	35.676	7,629
1887	9,674.	1.832	11,418.25	2.162	469
1888	8,814.75	1.669	13,872.	2.627	431
1889	10,021.75	1.898	11,264.5	2.133	472
1890	9,300.58	1.761	13,972.9	2.644	449
1891	9,307.5	1.762	14,276.66	2.704	483
1892	10,012.58	1.896	12,803.25	2.424	506
1893	8,616.25	1.631	11,064.	2.095	430
1894	7,218.	1.367	11,035.	2.09	366
1895	7,469.	1.414	12,407.	2.35	366
1896	7,067.83	1.34	8,796.	1.66	346
1897	8,324.11	1.576	9,805.2	1.857	383
1898	7,291.	1.38	12,878.75	2.439	342
1899	7,234.25	1.37	12,134.	2.298	336
1900	6,047.25	1.126	8,241.5	1.56	284
1901	6,506.75	1.232	7,291.25	1.38	315
1902	4,604.	.872	7,255.	1.374	225
1903	6,027.	1.141	10,054.	1.904	297
1904	5,596.	1.059	8,529.5	1.615	284
1905	7,071.	1.339	8,549.	1.619	347
1906	5,847.	1.107	11,101.	2.102	301
1907	6,213.	1.176	8,593.	1.627	308
	329,866.96	62.446	413,728.24	78.34	15,369

WATER-CART HYDRANTS, 1907.

Adams,	14′ 6″ out from stand pipe, 43 6 N. of N. line of Shrews bury St., looking east.
Ætna,	Near Coral St., 10′ 6″ out from stand pipe.
Austin,	24′ 6″ W. of W. line of Queen St., 11 6 out from stand pipe.
Belmont,	14′ out from stand pipe, 64′ W. of E. line of W. pier of driveway to Hospital.
Benefit,	59′ 7″ E. of E. line of Beacon St., 15′ 10″ S. of N. line of St., 26′ 6″ out from stand pipe.
Bloomingdale Rd.,	104′ E. of E. line of Grafton St. (S.), 15′ 9″ N. of S. line of St., 22′ out from stand pipe.
" "	7′ 8″ out from stand pipe.
Bowdoin,	13′ E. of E. of Chestnut St., 5′ N. of stand pipe.
Bridge,	36′ 6″ W. of W. line of viaduct wall (S.), 20′ 4″ out from stand pipe.
Burncoat,	21′ E. of W. line of St., 18′ 9″ N. of N. line of Melville St.
Cambridge,	12′ 6″ S. of N. line of St., 3′ 6″ E. of W. line of Southbridge St.
"	16′ 9″ S. of N. line of St., 25′ E. of E. line of Douglas St.
"	11′ 6″ out from stand pipe.
" cor. Douglas,	15′ S. of N. line of St., 25′ E. of E. line of Douglas St.
Carroll,	7′ out from stand pipe.
Chandler,	43′ 6″ W. of W. line of Newbury St., 20′ 9″ out from stand pipe.
" near Park Ave.,	30′ W. of W. line of Park Ave., 7′ 3″ out from stand pipe.
" " Bellevue,	16′ E. of W. line of Wright's new machine shop, 24′ 8″ N. of stand pipe.
Chatham,	75′ 6″ E. of E. line of Houchin Ave., 12′ out from stand pipe.
Commercial,	20′ S. of N. line of Central St., 18′ E. of W. line of Commerical St.
Congress,	51′ 6″ W. of W. line of Crown St., 18′ out from stand pipe.
Crescent,	23′ 8″ out from stand pipe.
Crown,	4′ 4″ out from stand pipe.
Cutler,	6′ 3″ N. of N. line of Union Ave., 18′ 6″ out from stand pipe.
Eastern Ave.,	Near Belmont St., 19′ 10″ out from stand pipe.
E. Central, n. Ford,	26′ 2″ out from stand pipe.
Elizabeth,	4′ S. of N. line of schoolhouse, 24′ 9″ out from stand pipe.
Elm,	North side, about 100′ W. of Chestnut St., about 12′ E. of elm tree, 9′ 2″ out from stand pipe.
Ferdinand,	19′ 3″ E. of W. line of house No. 1, 6′ 4″ out from stand pipe.
Florence,	8′ 7″ out from stand pipe.
"	25′ N. of N. line of Charlotte St., 16′ E. of W. line of Florence St.
"	20′ 5″ S. of S. line of May St., 26′ 10″ out from stand pipe.
Foster,	50′ 6″ E. of W. line Fire Dept. Headquarters, 30′ 2″ out from stand pipe. Stand pipe box, 6′ 4″ out from stand pipe.
Front,	63′ 7″ W. of W. line of Church St., 64′ N. of stand pipe.
Fruit, n. Dayton,	7′ out from stand pipe.
Garden,	54′ 3″ W. of W. line of Lincoln St., 19′ 6″ N. of S. line of Garden St., 23′ 9″ out from stand pipe.
Gold,	E. side, about 30′ S. of catch-basin, S. side of Bradley St., 20′ out from stand pipe.
Grand, n. Douglas,	8′ 10″ out from stand pipe.
Green,	27′ 8″ N. of S. line of Crompton's shop, 14′ 4″ out from stand pipe.
Grove,	49′ S. of S. line of Lexington St., 34′ 3″ out from stand pipe.
"	End of wire mill, 7′ 9″ out from stand pipe.
"	Near North St., 8′ 6″ out from stand pipe.
Hermon,	14′ 4″ from S. line of barn wall on N. W. cor. Southbridge and Hermon Sts. 30′ 2″ W. of E. line of barn, 8′ 10″ S. of stand pipe.
"	9′ 6″ S. of N. line of Hermon St., 27′ E. of E. line of Main St.
Highland,	7′ 9″ out from stand pipe.
"	14′ W. of W. line of Boynton St., 10′ 3″ S. of stand pipe.
"	43′ E. of E. line of Westland St., 22′ 9″ out from stand pipe.
"	31′ 6″ out from stand pipe.
"	Near Newton Sq., 32′ 6″ out from stand pipe, 1′ 6″ E. of center of stand pipe.
Hollywood,	S. of May St., 6′ 10″ out from stand pipe.
Home,	N. side, front of schoolhouse lot, opp. end of Wesby St., 6′ 8″ out from stand pipe.
Hooper,	9′ 8″ S. of N. line of Kendall St., 7′ 3″ out from stand pipe.
Hudson,	59′ 6″ S. of S. line of Elm St., 26′ out from stand pipe.
Illinois,	27′ 4″ W. of W. line of Grand St., (S.), 19′ 10″ N. of stand pipe.
Institute Rd.,	Near Beechmont St., 3′ 4″ out from stand pipe.
" "	Near West St., 2′ 6″ out from stand pipe.
Jaques Ave.,	W. side between two trees front of schoolhouse lot, 8′ 6″ out from stand pipe.
" "	2′ 4″ E. of E. line of front part of house No. 80, 18′ 10″ out from stand pipe.
King,	17′ W. of W. line of Queen St., 24′ out from stand pipe, ¾″ stop, 17′ 9″ W. of W. line of Queen St., 22′ 3″ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

King,	7′ 10″ out from stand pipe.
Lafayette,	13′ S. of N. line of St., 31′ W. of W. line Quinsigamond Ave., ¾″ stop, 11′ 2″ S. of N. line of St., 32′ W. of W. line of Quinsigamond Ave.
Lagrange,	50′ S. of S. line of Beacon St., 20′ out from stand pipe.
Lake,	19′ 9″ out from stand pipe.
" Ave.,	5′ 6″ N. of N. line of waiting station, 25′ 9″ out from stand pipe.
Lancaster,	14′ S. of S. line of Institute Rd., 27′ out from stand pipe.
Lincoln,	10′ 9″ N. of N. line of Perkins St., W. of Lincoln St., 14′ out from stand pipe.
Lodi,	4′ 3″ out from stand pipe.
Madison,	7′ 2″ W. of W. line of Southbridge St., 22′ 8″ out from stand pipe.
Main,	At Hammond St., 7′ W. of stand pipe.
"	22′ 9″ W. of E. line of Main St., 35′ N. of N. line of Gertrude Ave.
"	Near Grand St., 34′ N. of N. line of Downing St., 53′ E. of W. line of Main St., 3′ 6″ W. of stand pipe.
"	Opp. Marble St., 9′ 3″ out from stand pipe.
"	Near University Park, 9′ N. of stand pipe, 2′ 10″ out from stand pipe.
"	Near Park St., 25′ S. of stand pipe on branch of 2-way hydrant, 1′ 8″ W. of E. line of curbstone.
"	11′ 7″ N. of N. line of Park St.
Mass. Ave.,	At W. end of grass plot, 11′ 6″ S. of N. line Drury Lane (W.), 47′ E. of W. line of Massachusetts Ave., western section.
May, cor. Westfield.	9′ 4″ out from stand pipe.
Merrick,	107′ S. of S. line of Davis Ct., 7′ out from stand pipe.
Mill.	13′ 6″ N. of N. line of Quinn's Block, 27′ out from stand pipe.
Millbury,	Near the mill, 1′ 9″ W. of stand pipe, 2′ out from stand pipe.
"	Near Seymour St., 10′ W. of E. line of St., 13′ 9″ S. of N. line of Seymour St.
"	Near Greenwood St., 6′ N. of stand pipe.
"	Below the ledge, 2′ 6″ N. of stand pipe.
"	S. of Cambridge St., 13′ 3″ W. of E. line of St., 62′ 9″ N. of N. line of Whitney St.
Mulberry,	15′ E. of W. line of St., 27′ 3″ N. of N. line of Asylum St., 22′ 6″ out from stand pipe.
Newbury,	E. side opp. division fence N. of Austin St., 6′ 9″ out from stand pipe.
Oak Ave.,	18′ 9″ E. of W. line of Ave., 26′ N. of N. line of Belmont St. (W.).
Orange,	E. side near Myrtle St., 6′ S. of electric light pole, 5′ 9″ out from stand pipe.
Orient,	3″ valve, 21′ N. of N. line of Hamilton St., 18′ 8″ E. of W. line of Orient St., ¾″ stop 17′ 6″ E. of W. line of St., 22′ 3″ N. of N. line of Hamilton St.
Oxford,	15′ S. of S. line of Pleasant St., 8′ out from stand pipe.
Paine,	Near Perkins St., 8′ out from stand pipe.
"	Near Vinton St., 9′ 6″ out from stand pipe.
Park Ave.	Box on Lovell St., 28′ 3″ S. of stand pipe, 12′ E. of W. line of Park Ave.
" "	7′ out from stand pipe.
" "	98′ 6″ N. of N. line of house, 194 Park Ave., 18′ 10″ out from stand pipe.
Penn Ave.	15′ 9″ E. of W. line of Ave., 20′ 4″ S. of S. line of Ave.
Piedmont,	33′ 6″ N. of N. line of Brigham St., 22′ out from stand pipe.
Plantation	13′ 8″ N. of N. line of Shrewsbury St., 9′ 8″ W. of E. stone wall cor. Shrewsbury and Plantation Sts., 26′ 4″ N.W. from stand pipe.
Plum,	30′ S. of S. line of Shrewsbury St., 7′ 7″ out from stand pipe.
Pond,	Cor. Harding St., 7′ 9″ out from stand pipe.
Portland,	10′ E. of W. line of Portland St., 2′ S. of stand pipe.
Prescott,	Above wire mill, 9′ 10″ out from stand pipe.
"	Near North St., 21′ out from stand pipe.
"	2′ 6″ out from stand pipe.
Richards,	8′ out from stand pipe.
Salisbury,	18′ 6″ W. of W. line of Dean St., 7′ out from stand pipe.
"	Cor. Park Ave., 8′ 10″ out from stand pipe.
Sheridan,	Box on Shrewsbury St., 27′ N. of S. line of St., 12′ E. of W. line of Sheridan St.
Shrewsbury,	12′ 3″ N. of S. line of Shrewsbury St., 18′ W. of W. line of schoolhouse fence.
"	11′ E. of E. line of 377, 24′ N. of N. line of same.
"	9′ 9″ N. of S. line of St., 2′ 2″ W. of stand pipe.
"	About 75′ E. of Seward St., 2′ 6″ N. of S. curb, 2′ 6″ W. of stand pipe, box 1′ 3″ W. of stand pipe.
Sigel,	66′ 9″ W. of W. line of Harding St.
Southbridge,	Near Prov. & Worc. R. R., 9′ 3″ out from stand pipe.
Southgate,	26′ 9″ W. of W. line of Southbridge St., 24′ 6″ out from stand pipe.

WATER-CART HYDRANTS (*continued*).

Sturgis,	S. side opp. greenhouse, about 200′ from Lincoln St., 20′ 5″ out from stand pipe.
Summer,	17′ 3″ E. of W. line of St., 66′ 6″ S. of S. line of Central st.
Sycamore,	S. side in front of schoolhouse lot, 16′ 6″ out from stand pipe.
Temple,	29′ 8″ S. of N. line of St., 22′ 10″ E. of W. line of Jourdan's barn.
Tufts,	W. side near division fence, N. of No. 2, 7′ out from stand pipe.
Vernon,	21′ 9″ E. of E. line of Richland St., 10′ 6″ out from stand pipe.
Wall,	Near Norfolk St., 26′ out from stand pipe.
Ward,	3′ 6″ out from stand pipe.
"	19′ 6″ W. of W. line of Wade St., 17′ 6″ out from stand pipe.
Washington	21′ 6″ N. of N. line of Plymouth St., 15′ 10″ W. of E. line of Washington St., ¾″ stop, 21′ 6″ N. of N. line of Plymouth St.
	¾ stop 21′ 6″ N. of N. line of Plymouth St., 17′ 6″ W. of E. line of Plymouth St.
"	19′ 3″ out from stand pipe.
Water,	8′ 9″ out from stand pipe.
Waverley,	N. side, 6′ E. of third tree W. of Coral St., 8′ 10″ out from stand pipe.
Westminster,	7′ 6″ out from stand pipe.
William,	7′ out from stand pipe.
"	7′ 3″ out from stand pipe.
Windsor,	N. of Harrington Ave., 19′ out from stand pipe.
Winslow,	15′ 9″ S. of S. line of Pleasant St., E. of Winslow St., 22′ out from stand pipe.
Winthrop,	Near Providence St., 6′ 3″ N. of stand pipe.
Woodland,	12′ 10″ N. of S. line of schoolhouse lot, 6′ 10″ out from stand pipe.
"	Near Downing St., 2′ 8″ out from stand pipe.
Wyman,	22′ 9″ S. of S. line of Hollis St., 22′ 9″ out from stand pipe.

CAR-SPRINKLING HYDRANTS.

Belmont,	2 2′ 7″ S. of N. line of St., 36′ W. of W. line of Oak Ave.
Bloomingdale Rd.,	At cor. of Putnam Lane.
Boynton,	17′ 4″ E. of W. line of St., 39′ N. of N. line of Highland St.
Burncoat,	14′ 6″ E. of W. line of St., 94′ S. of S. line of engine house.
E. Worcester,	At Shrewsbury St., 3′ 3″ S. of S. line of Shrewsbury St., 14′ 4″ E. of W. line Norcross Bros'. office.
Franklin Sq.,	35′ W. of E. line of Main St., 14′ N. of S. line of Allen Ct.
Fremont,	21′ 6″ S. of N. line of St., 74′ E. of E. line of house No. 22.
Grafton,	22′ N. of S. line of St., 1′ E. of E. line of Houghton St.
"	51′ 4″ W. of E. line of Grafton St., 14′ S. of N. line of Keese St.
Grove,	12′ 10″ W. of E. line of St., 50′ 7″ S. of S. line of No. 328.
Highland,	12′ 4″ S. of N. line of St., 14′ W. of W. line of 162 Highland St.
June,	17′ W. of E. line of June St., 56′ N. of N. line of Chandler St., looking west.
Lincoln,	At house No. 160.
"	24′ W. of E. line of St., 14′ 2″ S. of N. line of Perkins St.
Main,	16′ 7″ W. of E. line of St., 11′ 3″ N. of N. line of Beaver St.
"	39′ 4″ N. of S. line of St., 88′ W. of W. line of McMullen lot No. 14.
"	20′ S. of N. line of Main St., 86′ 6″ E. of E. line of Lake St.
"	31′ N. of S. line of St., 5′ 6″ W. of W. line of ell part of house No. 1482 Main St.
"	19′ W. of E. line of St., 23′ S. of S. line of Hammond St.
Mill,	18′ W. of E. line of St., 31′ N. of N. line of Main St.
Millbury,	N. of Sigel St., 6″ gate on hydrant will shut this off.
"	26′ W. of E. line of St., 10′ N. of S. line of Maxwell St.
"	11′ 6″ W. of W. line of St., 15′ S. of N. line of Perry St.
Park Ave.,	21′ W. of E. line of Park Ave., 76′ S. of S. line of Fern St.
" "	23′ 8″ W. of E. line of Park Ave., 39′ N. of S. line of Harrington & Richardson's shop.
Pleasant,	15′ S. of N. line of St., 9′ 6″ E. of W. line of 137 Pleasant St.
"	19′ 6″ S. of N. line of St., 32′ 9″ W. of W. line of Park Ave.
"	20′ S. of N. line of St., 151′ W. of W. line of 414 Pleasant St.
"	3″ valve, 18′ W. of E. line of Pleasant St., 3′ 6″ S. of N. line of Wetherell's farm house.
Providence,	107′ S. of N. line of S. pier to Crompton's driveway, 20′ 3″ E. of W. line of Providence St.
Salem,	34′ 6″ S. of S. line of Front St., 26′ 6″ W. of E. line of Salem Sq.
Salisbury,	19′ W. of E. line of St., 23′ 8″ N. of N. line of Lincoln Sq., this gate shuts to the right.
"	3″ valve, 36′ 6″ E. of E. line of Park Ave., 19′ S. of N. line of Salisbury St.
Shrewsbury,	115′ S. of N. line of Hunt St., 20′ W. of E. line of Shrewsbury St.
Southbridge,	426′ 6″ S. of N. line of Lafayette St., 17′ 6″ W. of E. line of Southbridge St.
Summer,	17′ E. of W. line of St., 29′ S. of S. line of Prospect St.
Vernon,	18′ 8″ W. of E. line of St., 24′ S. of S. line of Union Ave., looking west.
Washington Sq.,	43′ 6″ W. of W. line of Summer St., 40′ 8″ N. of S. line of Front St.
Webster,	3′ 8″ E. of E. line of St., 9′ 2″ N. of S. line of Jacques St.
W. Boylston,	Near Fair Grounds, 1′ S. of S. rail in center of turnout, near Fair Grounds.
" "	Near Huntington Ave., 16′ W. of E. line of W. Boylston St., 52′ S. of S. line of Huntington Ave.

DRINKING FOUNTAINS.

Cambridge,	17′ S. of N. line of St., 42′ 6″ E. of E. line of Southbridge St.
" Sq.,	On Millbury St., 30′ 4″ W. of E. line of St., 51′ 3″ S. of S. line of Cambridge St.
Franklin Sq.,	14′ 3″ E. of E. line of Scott's block, 20′ 3″ N. of N. line of same.
Front,	Cor. Salem Sq., 65′ 6″ from base of fountain, 42′ 9″ W. of W. line of Church St.
"	Cor. Summer, on Summer St., 26′ E. of W. line of St., 8′ 8″ N. of N. line of Front St.
Lincoln Sq.,	Cor. Main St., shut-off in sidewalk.
Millbury,	Cor. Reeves St., 1′ 6″ W. of W. line of Millbury St., 27′ 9″ S. of N. line of Reeves St.
Plantation, cor. Belmont,	15′ E. of W. line of Plantation St., 6′ S. of S. line of Belmont St., 9′ 2″ out from drinking fountain.
Union Sq.,	11′ W. of W. line of Providence St., 20′ 6″ N. of S. line of Winter St.
Vernon Sq.,	22′ 4″ S. of N. line of Vernon St., 8′ S. of N. line of house No. 108 Water St., 8′ E. of W. line of Water St.
Webster Sq.,	30′ 9″ N. of S. line of Cambridge St., 25′ 6″ W. of W. line of Webster St.

WATERING TROUGHS.

Adams Sq.,	20′ W. of E. line of Lincoln St., on S. line of Shattuck St.
Belmont,	At Lake, 11′ 6″ S. of S. line of Belmont St., 34′ 7″ E. of W. line of Lake Ave.
Chadwick Sq.,	29′ S. of hydrant, 35′ 6″ E. from watering trough.
Chandler,	10′ 2″ E. of W. line of Bellevue St.; 16′ 8″ S. of N. line of Chandler St., W.
"	31′ 6″ N. of S. line of Chandler St., 6′ 9″ E. of W. line of Mill St.
Coes Sq.,	11′ 4″ W. of E. line of St., 19′ N. of N. end of parapet wall, 42′ 10″ S. of S. line Coes' shop, 56′ 8″ S. of S. line of Beaver St.
Grafton,	Cor. Hamilton St., 16′ 5″ S. of N. line of St., 32′ 6″ N. of trough, 100′ 6″ W. of W. line of Orient St.
James,	14′ out from center of trough, ½ rod stop, 11′ 9″ out from center of trough.
Lincoln Sq.,	43′ 8″ S. of N. line of Lincoln Sq., 10′ 3″ W. of W. line of Prescott St.
Millbury,	30′ 4″ W. of E. line of St., 51′ 3″ S. of S. line of Cambridge St.
"	At Greenwood St., 26′ 4″ directly E. from trough.
Pleasant,	7′ 3″ out from X on trough near the ground.
Southbridge,	33′ 2″ from W. line of Southbridge St., 28′ S. of S. line of Southgate St.
"	At Madison St., 32′ 9″ out from trough at Madison Sq., 36′ 6″ S. of S. line of No. 114.
"	At Stearns Sq., 6′ 3″ out from trough, 1′ 8″ S. from trough, drip 4′ S. of trough, 2′ 6″ W. of E. end of trough.
Vernon Sq.,	On Vernon St., 5′ 6″ above gate box, 6′ 9″ out in direct line from where it enters the trough.
Washington Sq.,	On Shrewsbury St., W., 36′ 6″ S. of N. line of St., 60′ E. of E. line of Summer St.
Webster Sq.,	15′ 9″ W. of W. line of Webster St., 30′ 10″ N. of S. line of Cambridge St.

EXPENDED, 1907.

WATER WORKS CONSTRUCTION.

Salary of Commissioner George W. Batchelder,	$2,250 00
Payrolls, laborers,	19,656 53
Clerical service,	1,301 38
Brick and freight on same,	6 19
Carpentering and lumber,	90 98
Castings, patterns and fire clay,	2,816 01
Cement,	93 68
Cordage, waste and packing,	39 50
Engineers' services and materials,	221 58
Express, freight and trucking,	689 10
Fuel,	29 25
Hardware, tools and repairs,	43 95
Hydrants, water gates, valves and repairs,	3,585 10
Inspection of pipe, hydrants and valves,	192 13
Iron pipe and freight on same,	15,104 42
Iron and steel,	37 14
Lead pipe and lead,	2,204 35
Meters and repairs,	3,401 50
Meters and repairs, Union Water Meter Co.,	6,227 65
Meters taken out,	104 00
Miscellaneous supplies and expenses,	19 90
N. E. Tel. & Tel. Co., rental and service,	1 85
Pipe, fittings, etc.,	3,547 30
Powder and fuse,	143 86
Putting in meter box,	88 13
Repairs, sewers,	34 64
Repairs, streets,	165 39
Sewer pipe and sand,	11 50
Special castings for iron pipe,	2,030 17
Stone for blocking,	4 85

Traveling expenses,	64	
Connecting fountain with surface sewers,	91 39	
		$64,234 06
Balance November 30, 1906,	$463 34	
Transfers,	35,000 00	
Revenue,	28,973 45	
		$64,436 79
Expenditures,		64,234 06
Balance November 30, 1907,		$202 73

PIPE IMPROVEMENT AND EXTENSION.

Pay rolls, laborers,	$5,508 86	
Express, freight and trucking,	586 95	
Horse hire,	5 63	
Hydrants, water gates, valves, repairs and freight,	2,417 88	
Lead,	1,266 82	
Repairs, streets,	506 94	
Special castings for iron pipe,	1,024 20	
Engineers' services and materials,	31 12	
Iron pipe and freight on same,	10,879 35	
Inspection of hydrants, pipe and valves,	189 66	
Stone for blocking,	5 40	
Brick,	4 95	
Repairs, sewers and catch basins,	469 05	
Advertising,	2 63	
		$22,899 44
Balance November 30, 1906,	$ 97	
Appropriation,	25,000 00	
		$25,000 97
Expenditures,		22,899 44
Balance November 30, 1907,		$2,101 53

KETTLE BROOK SUPPLY.

Pay rolls, laborers,	$1,729 06	
Automobile hire,	9 00	
Carpentering and lumber,	37 89	
Cement,	19 89	
Engineers' services and materials,	433 20	
Hardware, tools and repairs,	1 72	
Miscellaneous supplies,	94	
Rubber goods,	5 00	
Team work,	14 95	
Walter E. Clark, land in Paxton,	925 00	
Refreshments,	2 00	
Posts and wire fence,	54 52	
Stone posts,	6 00	
Horse hire,	2 00	
		$3,241 17
Balance November 30, 1906,	$5,883 39	
Revenue,	65 30	
		$5,948 69
Expenditures,		3,241 17
Balance November 30, 1907,		$2,707 52

HOLDEN SUPPLY.

Pay rolls, laborers,	$161 04	
		$161 04
Balance November 30, 1906,	$161 04	
Expenditures,	161 04	

ASNEBUMSKIT SUPPLY.

Pay rolls, laborers,	$17,859 13
Pay rolls, team work,	474 15
Appraising land,	10 00
Blacksmithing,	26 05
Blank books, stationery and stamps,	3 46

Blankets, harness and repairs,	44 35
Board of men and horses,	56 65
Car fares,	160 00
Cement and freight on same,	1,632 83
Cordage, waste and packing,	20 98
Engineers' services and materials,	1,612 35
Express, freight and trucking,	196 74
Fuel,	168 89
Furniture, fixtures and repairs,	4 50
Gasolene,	27 31
Hardware, tools, and repairs,	110 34
Iron and steel, and freight on same,	552 71
Legal expenses,	67
Lumber and freight on same,	717 70
Miscellaneous supplies and expenses,	12 21
Paints and oils,	12 26
Pipe and fittings,	177 84
Powder and fuse,	31 63
Railroad supplies,	14 20
Record of waste water,	100 00
Repairs, boilers, engines and machinery,	63 58
Repairs, buildings,	86 75
Rubber goods,	81 12
Stone,	200 00
Valves, water gates, and freight on same,	1,020 00
Tiles,	45 98
Steel crusher and freight on same,	904 02
Carts, wagons and repairs,	47 25
Hay, grain and straw,	28 50
Acme Road Machinery Co., steel crusher,	372 73
Charles H. Howe, standing wood,	75 00
Bags,	30 81
Traveling expenses,	1 10
Lead,	12 03
Horse hire,	6 00
Brass trimmings for gate house,	48 00
Brick and freight on same,	152 00
Manhole cover,	2 46

Photographic supplies,	1 67	
F. L. Allen, rent of stone crusher,	180 00	
Incidentals—expenses for preliminary surveys:		
Board of men and horses,	406 73	
Engineers' services and materials,	1,664 79	
Extra labor,	159 86	
Hack and horse hire,	151 20	
Record of waste water,	200 00	
Telephone tolls,	55	
Traveling expenses,	12 32	
		$29,981 40
Balance November 30, 1906,	$18,756 55	
Transfers,	11,000 00	
Revenue,	267 65	
		$30,024 20
Expenditures,		29,981 40
Balance November 30, 1907,		$42 80

NEW WORKSHOP ACCOUNT.

Advertising,	$29 83	
Frost, Briggs & Chamberlain, architects' services,	561 25	
Engineers' services and materials,	11 91	
George Sessions & Sons, removing bodies,	10 00	
		$612 99
Transferred,	$28,000 00	
Expenditures,	612 99	
Balance November 30, 1907,		$27,387 01

NEW STABLE ACCOUNT.

Frost, Briggs & Chamberlain, architects' services,	$550 00	
		$550 00

Transferred,	$24,000 00	
Expenditures,	550 00	
Balance November 30, 1907,		$23,450 00

Value of stock and tools on hand November 30, 1907, $131,-416.70. Bills have been rendered to the City Treasurer to the number of 2853, amounting to $28,690.84.

Number of abatements, thirty-four, amounting to $342.74.

Amount of bills in hands of Treasurer, November 30, 1907, $6,062.77.

Amount collected during the year, $28,967.67.

Respectfully submitted,

GEORGE W. BATCHELDER,
Water Commissioner.

REPORT OF THE WATER REGISTRAR.

To the Honorable City Council of the City of Worcester.

Gentlemen: In compliance with section 11, chapter 48, of the City Ordinances, the report of the income division of the Water Department for the year ending November 30, 1907, is presented.

Three hundred and twenty-one (321) applications for water were received during the year and placed in the hands of the Water Commissioner.

The following bills were given the Treasurer for collection:

For metered water,	28,101 bills,	amounting to	$356,028 23
For annual rates,	504 bills,	amounting to	7,053 53
Total bills,	28,605	Total amount,	$363,081 76

Total amount of revenue received during the year ending November 30, 1907, $360,023.48. Of this amount $5,996.64 was from uncollected bills in the hands of the Treasurer November 30, 1906.

The amount of uncollected bills in the hands of the Treasurer November 30, 1907, was $8,384.72 Of this amount $1480 was for bills against the Worcester Insane Hospital for water taken from unmetered connections in the grounds, and which have been placed in the hands of the Law Department for collection. $1,461.26 was for bills due from the Public Buildings Department, and a large per cent. of the balance was for bills against estates in process of settlement and insolvent concerns. Most of the above accounts will be settled before January 1, 1908.

During the year the sum of $1022.58 has been abated owing to changes from annual rates to metered rates, vacant tene-

ments and adjustment of bills of water takers. $1870.57 was transferred.

Forty-four services were shut off for non-payment of bills, and with few exceptions, these bills have been paid and water turned on.

During the past year 3816 houses have been inspected and 3283 notices have been sent to owners notifying them of leaks in the water fixtures in their premises.

FINANCIAL STATEMENT FOR THE YEAR ENDING NOVEMBER 30, 1907.

RECEIPTS.

For assessments for water, 1906,	$6,370 83	
For assessments for water, 1907,	353,652 65	
Apples,	25 00	
Barn and sheds,	125 00	
Boilers,	350 00	
Cement,	12 96	
Conscience money,	05	
Gasolene,	13 05	
Hardware and tools,	31 86	
Hay and grain,	457 95	
Horse,	25 00	
Lead,	12 03	
Miscellaneous supplies,	3 55	
Refuse material and junk,	1 00	
Rent of engine,	195 00	
Rent of land,	51 00	
Wages uncalled for,	6 94	
Wood,	11 50	
		$361,345 37

EXPENDITURES.

Amount transferred to interest on water loan,	$143,363 90	
Amount transferred to sinking fund, per order City Council,	2,125 00	

Amount transferred from revenue to Water Department (pipe con.), per order City Council,	35,000 00	
Amount transferred from revenue to Water Department (construction new stable), per order City Council,	24,000 00	
Amount transferred from revenue to Water Department (construction new workshop), per order City Council,	28,000 00	
Amount transferred from revenue to Water Department (development of Asnebumskit supply), per order City Council,	11,000 00	
Running expenses,	73,870 23	
		317,359 13
Balance transferred to sinking fund (water bonds),		$43,986 24

DETAILED ACCOUNT OF EXPENDITURES.

For salary of Registrar George C. Hunt,	$1,750 00
Payrolls, laborers,	33,780 05
Clerical service,	1,939 19
Service of canvassers,	606 37
Service of meter readers,	6,197 01
Care of reservoirs,	2,064 00
Advertising,	24 89
Automobile hire,	424 41
Blacksmithing and blacksmiths' supplies,	242 06
Blank books, stationery and stamps,	836 74
Blankets, harness and repairs,	152 27
Boilers and repairs,	45 15
Books and subscriptions,	21 50
Car tickets and transportation of laborers,	449 35

Carpentering and lumber,	499 18
Carts, wagons and repairs,	430 60
Castings, patterns and fire clay,	1,080 51
Cement,	122 31
Cordage, waste and packing,	229 85
Crushed stone,	12 64
Damage caused by bursting pipe,	279 99
Drinking fountains and repairs,	137 20
Engineers' services and materials,	1,119 32
Express, freight and trucking,	110 29
Extra labor, sundry persons,	30 25
Fuel,	402 40
Furniture, fixtures and repairs,	43 95
Gas,	214 57
Hack and horse hire,	63 56
Hardware, tools and repairs,	877 49
Hay, grain and straw,	2,273 56
Hose and couplings,	190 05
Hydrants, water-gates, valves, and repairs,	899 43
Ice,	18 09
Insurance on boilers,	160 00
Iron and steel,	280 84
Lead pipe and lead,	2 18
Loam, fertilizer and seeds,	8 85
Medical attendance on horses,	85 00
Meters and repairs,	611 20
Meters and repairs (Union Water Meter Co.),	2,717 77
Miscellaneous supplies and repairs,	301 10
N. E. Telephone & Telegraph Co., rental and service,	67 46
Paints, oils and painting,	232 88
Pipe, fittings, etc.,	190 39
Printing and photographs,	76 44
Refreshments for committee and guests,	212 60
Refreshments for laborers,	43 60
Rent of barn,	110 00

Rent of land for watering trough (B. & A. R. R. Co.),	1	00
Rent of land, Woodward Street (M. J. Whittall),	300	00
Rent of and repairs on machinery,	70	17
Repair of buildings,	174	17
Repair of sewers,	4	23
Repair of streets,	252	47
Rubber goods,	326	19
Services of auctioneer,	29	48
Sewer pipe, lime and sand,	80	91
Special castings for iron pipe,	2	00
Stone posts, wall stone and labor,	21	75
Taxes in Holden,	192	31
Taxes in Leicester,	364	85
Taxes in Paxton,	171	04
Team work,	12	75
Traveling expenses,	14	44
Typewriter supplies and repairs,		95
Watering streets,	6	36
Cynthia A. Davis, damage to property,	68	35
Nicholas R. Power, damage to property,	45	00
Repairing Millbrook canal,	452	73
Threading machine,	67	10
Wire fence,	227	78
Joseph O. Phelon, services of expert engineer,	75	00
Traveling expense, viewing Ware River,	17	00
Fire extinguishers,	54	00
Switching iron pipe,	16	00
Shavings,	44	00
Edwin Hawes Co., heating plant,	242	00
Jeremiah Sullivan, injury to person,	82	00
Payrolls, laborers (Holden),	7,284	04
Payrolls, team work (Holden),	387	71
Payrolls, laborers (Kettle Brook),	15	24
Payrolls, laborers (Lynde Brook),	23	00
Payrolls, laborers (Parsons),	75	67
		$73,870 23

Revenue.

The total amount of revenue received from the collection of water rates during the financial year ending November 30, 1907, was $360,023.48, the largest in the history of the department, and an increase of $31,665.20 over the preceding year.

Table showing the revenue and increase since 1890:

	Revenue.	Increase.
1890	$140,293 71	
1891	148,332 04	$8,038 33
1892	164,638 19	16,306 15
1893	185,564 63	20,926 44
1894	185,940 02	375 39
1895	200,255 51	14,315 49
1896	207,295 65	7,040 14
1897	210,064 16	2,769 51
1898	222,006 33	11,942 17
1899	238,462 14	16,455 81
1900	262,175 74	23,713 60
1901	259,429 06	—2,746 68
1902	269,428 64	9,999 58
1903	270,651 66	1,223 02
1904	293,794 02	23,142 36
1905	308,387 73	14,593 71
1906	328,358 28	19,970 55
1907	360,023 48	31,665 20

The quantity of water, in gallons, furnished and charged for during the year ending November 30, 1907, was as follows:

Domestic purposes,	806,183,464
Manufacturing purposes,	558,310,922
Steam and electric railways,	263,100,540
Elevators,	264,204,640
Motors,	5,326,854
Schools,	34,764,092
Churches,	3,951,491
Hotels,	24,381,290

Hospitals,	88,702,526	
Stables,	8,791,155	
Laundries,	38,264,084	
Fire Department houses,	2,648,370	
Sewer Department,	2,229,687	
Street Department,	757,674	
Parks,	15,477,393	
Stores, offices, saloons, shops, etc.,	134,415,379	
Unmetered water (estimated),	30,000,000	
		2,281,509,561

The quantity of water, in gallons, furnished during the year and for which no revenue is received, was as follows:

Street sprinkling,	103,577,500	
Merrifield estate,	54,598,050	
Blow off and hydrant flushing,	20,121,148	
Urinals,	16,572,000	
Watering troughs and drinking fountains,	43,683,000	
Water Department, for testing meters, etc.,	3,799,043	
Slow meters,	114,075,478	
Estimated water used in testing sprinkler systems,	1,225,000	
Miscellaneous purposes,	6,421,000	
		364,072,219
		2,645,581,780

DWELLINGS, PERSONS, FIXTURES, ETC., ASSESSED FOR WATER IN THE CITY OF WORCESTER.

Dwellings,	13,133	Markets,	92
Families,	29,236	Shops,	647
Stores,	1,493	Stables,	2,300
Offices,	1,387	Persons using,	144,775
Saloons,	107	Sinks,	35,602

Basins,	22,808	Cows and oxen,	889
Baths,	20,893	Elevators,	435
Water closets,	37,278	Barber shops,	162
Hose,	10,669	Hotels,	36
Boilers,	3,158	Schools,	82
Horses,	5,260	Motors,	48

The number of new meters set during the year was 312, making the total number now in use 14,775:

Kinds.	Sizes.										
	⅝″	¾″	1″	1½″	2″	3″	4″	6″	8″	10″	Total.
B. & F. Piston	317	39			5						361
Columbia	1										1
Crown	7	2									9
Desper	160	9									169
Duplex	1										1
Empire	1										1
Gem	1		1		1	4	10	10		3	30
Hersey	709	47	3	1	2		1				763
" detector							4	7			11
" disc....	1874		1	3							1,878
Keystone	2										2
King	355										355
Lambert	20										20
Nash....	86										86
Torrent			1		11	2	2	3			19
Trident	182	2	...								184
Union Rotary	9597	472	250	188	228	106	21	6	1		10,869
Worthington .	16										16
Total	13,329	571	256	192	247	112	38	26	1	3	14,775

During the year, 1 Gem, 172 Hersey, 353 Hersey disc, 44 King, 2 Lambert, 13 Nash, 2 B. & F. Piston, 1,979 Union Rotary, 47 Trident and 2 Worthington meters have been taken off for repairs. Most of them have been repaired at the department shop without cost to the owner. Total cost of repairs, $8,361.07. One hundred and eighty-one meters were condemned and replaced by others.

Table showing the monthly and the average daily consumption of water, in gallons, for the fiscal year:

Month.	Consumption per Month.	Average Monthly Consumption.	Average Daily Consumption for the Month.	Average Daily Consumption for the Year.
December	268,449,720		8,659,669	
January	274,635,680		8,859,215	
February	260,191,800		9,292,564	
March	283,925,840		9,158,898	
April	262,102,940		8,736,765	
May	266,115,960		8,584,386	
June	297,823,680		9,927,456	
July	314,152,520		10,133,952	
August	318,520,840		10,274,866	
September	287,344,200		9,578,140	
October	310,898,360		10,028,979	
November	298,332,320		9,944,411	
		286,874,489		9,431,490

The maximum consumption for one day amounted to 12,072,720 gallons, and the average daily consumption per consumer for the year was 66.84 gallons.

Table showing the yearly, daily, and per capita consumption of water, in gallons, for the past ten years:

	Yearly Consumption.	Average Daily Consumption.	Per Capita Daily Consumption.
1898	2,480,385,988	6,795,578	64.1
1899	2,785,836,000	7,632,428	68.9
1900	2,975,716,025	8,152,373	72.
1901	3,290,031,620	9,013,785	77.6
1902	2,997,335,636	8,211,878	68.8
1903	3,535,818,440	9,687,173	79.2
1904	3,739,925,200	10,218,374	83.7
1905	3,517,396,800	9,636,703	76.
1906	3,363,756,000	9,217,384	68.98
1907	3,442,493,860	9,431,490	66.84

Water metered and accounted for during the past ten years:

	Total Metered.	Total Accounted for.	Per Cent of Total Metered.	Per Cent of Total Accounted for.
1898	1,246,347,086	1,306,696,336	50.2	52.6
1899	1,362,278,941	1,467,419,741	48.9	52.3
1900	1,489,290,945	1,614,622,045	50.4	54.2
1901	1,519,770,438	1,640,019,938	46.1	49.8
1902	1,580,824,913	1,700,922,413	52.7	56.7
1903	1,620,727,639	1,748,753,629	45.8	49.4
1904	1,758,092,526	1,883,290,526	47.	50.3
1905	1,881,254,205	2,163,797,405	54.3	61.5
1906	2,052,903,499	2,442,748,265	61.	72.6
1907	2,251,509,561	2,645,581,780	65.4	76.8

STATISTICS OF CONSUMPTION OF WATER.

1.	Total population (water census),	147,084
2.	Population on line of pipe (water census),	144,775
3.	Population supplied (water census),	144,775
4.	Total consumption for the year,	3,442,493,860
5.	Passed through meters,	2,251,509,561
6.	Percentage of consumption metered,	65.4
7.	Average daily consumption,	9,431,490
8.	Gallons per day to each inhabitant,	64
9.	Gallons per day to each consumer,	66.84
10.	Gallons per day to each tap,	406
11.	Cost of supplying water per million gallons, figured on total maintenance expenses,	$31.62
12.	Cost of supplying water per million gallons, figured on total maintenance plus interest on bonds,	$73.27

REDUCTION OF WATER RATES.

I desire to call your attention to the financial condition of the Water Department with a view to the readjustment of the metered water rates, if it is deemed advisable.

The increase in the revenue of the Water Department during the past four years has been remarkable. In 1903 the amount of revenue received from the sale of water was $270,651.66 and in 1907 was $360,023.48, an increase of $89,371.82. This large increase in the revenue has placed the department on a self-supporting basis, and has been sufficient during the past three years to pay the entire cost of new pipe extension, meet its interest charges and running expenses, and has enabled the department to turn over to the Sinking Fund Commissioners an amount far in excess of the statute requirements. An important question, and one which you will be called upon in the near future to consider, is whether you will continue to pile up the surplus in the hands of the Sinking Fund Commission or whether you will give the present generation the benefit of a reduction in the water rates. It was never intended that the Water Department should be a money making institution, but that it should be conducted in such a manner that it would be able to furnish water to the inhabitants of the city at the lowest possible cost.

The system of selling water by meter was inaugurated by the city in the year 1869. At that time forty meters were installed. This system has grown to such an extent that at the present time 14,775 meters are in use. The price for water used through meters was fixed on the basis of the total consumption, and three rates were established, namely: One thousand gallons per day or less, twenty-five cents per thousand gallons; for one thousand to five thousand gallons per day, twenty cents per thousand gallons; for from five thousand to fifteen thousand gallons per day, fifteen cents per thousand gallons. No change has been made in these rates to the present time, with the exception of a class rate of ten cents per thousand gallons which was granted the manufacturers in the year 1901. The custom of selling water at a graded rate has never been satisfactory. It has always been an incentive to the large consumer to waste water in order to secure the lowest possible rate. It does not seem to me to be good business policy to encourage water takers to waste water.

After four years' experience as Water Registrar, I firmly believe that water should be sold to the consumer at a flat rate, and that eventually all citizens should be furnished water at the same price. It would, of course, be impossible to do this at once, as it would reduce the revenue to such an extent that the department would not be self-supporting. The reduction in rate should be gradual so that it would not result in crippling the department financially. For the reasons above stated, I would most respectfully recommend that, if your honorable boards, after a thorough investigation of the matter, should come to the conclusion that it was advisable to reduce the rates charged for metered water, the householder's rate of twenty-five cents per thousand gallons be reduced to twenty cents per thousand gallons, and, when the financial condition of the department will warrant it, that water be sold to the consumer at the flat rate of fifteen cents per thousand gallons.

Water Census.

The population of the city of Worcester for the year 1907, as returned by the census enumerators employed by the Water

Department, is 147,084. Of this number, 144,775 are water users and the balance, 2,309, are those living outside the water district. As doubt has often been expressed as to the accuracy of the census, I desire to say that a great deal of time and attention is given to it. This work is performed by two of the meter readers, who have been employed by the department many years, and who have had extended experience in this line of work, and covers a period of six months from May 1 to November 1. Every house on the line of the water pipes is visited and the number of families, number of people in each family, number of vacant tenements and a list of the water fixtures are taken. Under these circumstances, we believe that the chances of mistake are reduced to a minimum and that the number of inhabitants, as returned by the enumerators, is as near correct as it is possible to get it. In 1905, in order to make a satisfactory comparison with the state census, an actual count of the non-water takers was taken, and the number was found to be 2,309. This year the same number was used in computing the total number of inhabitants.

Recapitulation.

The increase in the revenue received from the sale of water during the past year was $31,665.20, the largest in the history of the department, and is a result, to a large extent, of the excellent business conditions which have prevailed during the year. This increase was about equally divided between the revenue received from the sale of water for domestic purposes and manufacturing purposes. The per capita daily consumption has been reduced from 68.98 gallons to 66.84 gallons, and is, I think, the lowest of any city of its size in the country. The per cent. of water accounted for has increased from 72.6 to 76.8. These conditions would indicate that a much larger per cent. of the water used is being paid for and that the waste has been reduced to a minimum.

Respectfully submitted,

GEORGE C. HUNT,
Water Registrar.

REPORT OF CITY ENGINEER.

CITY ENGINEER'S OFFICE, Dec. 12, 1907.

To the Honorable City Council of the City of Worcester.

Gentlemen: I have the honor to submit the following report exhibiting the work of the Engineering Department during the year ending November 30, 1907, as follows:

STREETS.

In accordance with orders of the City Council and preparatory to further action thereon, decrees have been prepared for the laying out and making public of 1.90 miles of streets, and 1.94 miles of sidewalks. The following tables exhibit a list of the streets, together with other information pertaining thereto:

STREETS LOCATED FROM DECEMBER 1, 1906, TO DECEMBER 1, 1907.

Street.	From	To	Width, Feet.	Length, Feet.	Date of Decree.	Remarks.
Ashmont ave	Millbury	Quinsigamondav	40	640.65	Dec. 5, '07	
Batchelder	Union ave	Winthrop	40	590.20	Nov. 22, '07	Relocation
Gold	Green	Washington	30	388.57		
Grace	Winter	Pond	22	303.07		
Grand St. place	Grand	Gates	30 35	398.74	Dec. 5, '07	
Hancock	Hathaway	Southerly	40	94.17	Dec. 5, '07	
Hillside	Vernon	Robbins	40	708.12	Jan. 5, '07	
Kilby	Tainter	Hollis	40	368.58	Dec. 5, '07	
Lake ave	The Circuit	Northerly	100	457.90	Jan. 5, '07	Relocation
Minthorne	Lovell	Westerly	30	753.23	Jan. 5, '07	
Mower ave	Main	Beacon	40	381.56	Oct. 9, '07	
Oswald	Stebbins	Southerly	40	348.26		
Park ave				97.72	Oct. 9, '07	Reloc. at Highland
Prentice	Shrewsbury	Belmont	40	734.10	Jan. 5, '07	
School				5.14	Jan. 1, '07	Relocation at Union
So. Stowell	Granite	Derby	40	259.21	Jan. 5, '07	
Tower	Huntington ave	Hastings ave	50	670.10		
West Boylston	Barbers Crossing	Greendale ave	60	2166.10	May 16, '07	Relocation
West				170.92	Jan. 5, '07	Reloc. at Salisbury
Whittier	Edgeworth	Hemans	40	509.60	Jan. 5, '07	
Total length				10,046.94		

Decrees for the establishment of sidewalk grades, preparatory to further action by the City Council, were provided for the following named streets:

Street.	From	To	Date of Decree.	Length, in Feet.	Side.
Brussels	Crompton	Southerly		506.95	South
Burncoat	Brittan sq	Melrose	Oct. 9, '07	930.90	East
Cambridge	Webster sq	Duncan ave	July 8, '07	948.80	North
Canterbury	Hammond	Gardner	July 8, '07	3000.00	Both sides
Canterbury	Grand	Morse ct	July 8, '07	525.00	Northwest
Commercial	Mechanic	Foster	Oct. 9, '07	266.30	East
Crompton	Southbridge	Brussels		147.82	South
Englewood ave	Lovell	Lisbon	Sept. 19, '07	660.00	Southwest
Hackfeld rd	Institute rd	Southerly	Oct. 9, '07	400.80	North
Hollis	Kilby	Gardner	Oct. 9, '07	268.00	South
Lincoln	Perkins	Southerly		327.20	East. relocation
Market	Union	Summer	Oct. 9, '07	362.00	South
Oberlin	Claremont sq	Woodland	Sept. 19, '07	759.85	Both sides
Park ave	Highland	Lee	Oct. 9, '07	350.00	Northwest
Richland	Ward	Millbury	Nov. 1, '07	400.00	East
Wade	Millbury	Ward	Nov. 1, '07	396.90	South
Total length				10,250.52	

Gradient and sectional stakes were set for the construction and pavement of the following list of streets:

Street.	From	To	Length, Feet.	Remarks.
Apricot	Armandale	Westerly	1350.00	
Ball	Mill	Baker	1232.15	
Cambridge	Main	Nixon ave	249.90	S. side, block paving
Camp	Cambridge	Southgate	878.16	Macadam
Canterbury	Hammond	Morse ct	2865.70	Hassam paving
Caroline	Grafton	Plantation	574.66	
Fiske	Hadwen rd	Chandler	1045.07	
Forbes	Westminster	Windsor	392.77	
Foster	Waldo	Bridge	1066.10	Brick paving
George	Main	Westerly	100.00	Block paving
Grafton	Union sq	Penn ave	897.90	Block paving
Greenwood	Upland	Millbury line	4697.18	
Hadwen rd	June	Fiske	370.62	
Huntington ave	West Boylston	Tower	532.61	
Lyon	Shrewsbury	East Worcester	716.57	
Main	Lake	Montague	895.50	Block paving, N. side
Marie ave	Burncoat	Westerly	1185.60	
May	Pleasant	Southerly	920.54	
Millbury	Quinsigamond av	Southerly	1337.20	Block paving, E. side
Millbury	Ballard	Northerly	2299.70	Block paving, W. side
Myrtle	Main	Southbridge	163.10	Block paving
Oread pl	Main	Alden	380.89	
Perkins	Paine	Windsor	1131.00	
Perkins	Windsor	Channing	187.64	
Prentice	Shrewsbury	Belmont	734.10	
Richland	Millbury	Ward	401.08	
Salem sq	Front	Park	366.00	W. of t'ks, bl'k pav'g
Southbridge	Madison	Southerly	896.70	Block paving
Southgate	Grand	Litchfield	1328.07	
South Stowell	Granite	Derby	259.21	
Spring	Front	Mechanic	339.30	Block paving
Wesby	John	Home	245.28	Macadam
West			170.92	Reloc. at Salisbury
Windsor	Green lane	Washington ave	884.12	
Total length			31,094.84	

For the setting of curbstones, gradient and alignment stakes were placed on the following streets:

Street.	From	To	Length, Feet.	Remarks.
Ames	Vernon	Easterly	1155.40	Both sides
Burncoat	Brittan sq	Northerly	100.76	East side
Brussels	Crompton	Southerly	400.00	East side
Cambridge	Webster	Duncan ave	948.80	North side
Canterbury	Hammond	Gardner	3000.00	Both sides
Canterbury	Gardner	Morse ct	1290.00	Southeast side
Canterbury	Grand	Morse ct	525.00	Northwest side
Channing	Hermitage lane	Forbes	450.00	West side
Cheever	Chelsea	Woodward	535.60	North side
Commercial	Foster	Southerly	50.00	East side
East Worcester	Plum	Westerly	199.84	North side
Elm ave	Pleasant	Midland	301.40	South side
Englewood ave	Lovell	Hobson ave	365.00	Northeast side
Englewood ave	Lovell	Lisbon	660.00	Southwest side
Foster	Bridge	Westerly	478.15	North side
George	Main	Westerly	100.00	South side, reset
Hollis	Kilby	Gardner	275.35	South side
Huntington ave	West Boylston	Tower	500.00	North side
Jaques ave	King	Easterly	535.00	South side
King	Queen	Southerly	225.38	East side
Main	Lake	Montague	860.08	South side
Maple	Maple pl	Northerly	124.60	West side
Mason	Chandler	Tufts	93.70	West side
Massachusetts ave	Salisbury	Metcalf	512.00	West side
Millbury	Ballard	Northerly	1356.90	Both sides, reset
Mower ave	Main	Easterly	212.72	North side
Oread place	Main	Northerly	384.10	West side
Park ave	Salisbury	Northerly	375.00	West side
Salisbury	West	Easterly	475.11	South side
Shrewsbury	East Central	Adams	7867.60	Both sides
Tufts	Mason	Park ave	811.30	North side
Total length			25,168.79	

Plans were provided for renumbering the following named streets, and notices were issued in accordance with the action of the City Council thereon:

Street.	From	To	Length, Feet.
Arlington	Columbia	Winthrop	1831.26
Crescent	Garden	Harlow	2623.24
Fairmont ave	Grafton	Plantation	3535.00
Hampden	West	Sever	701.50
Perkins	Paine	Channing	1318.64
Sigourney	North	Edgeworth	396.00
Suffield	Vernon	Perry ave	738.47
Total length			11,144.11

The following is a summary of street work for various purposes:

Street bounds set,	60
Street bounds reset,	15
Line and grade given on application,	157
Number of surveys to determine house encroachments,	1
Levels to establish grade on private street, and grade approved from profiles submitted,	11
Grade stakes and cross section for amount of material removed from Wilder's gravel bank,	
Line and grade for extension and changing street railway tracks in Fremont, Grove, Salisbury and Shrewsbury streets,	
Survey for spur track at city stable,	
Survey for accident and damage cases,	2
Survey to re-establish street bounds,	1
Locations examined and approved for electric light conduits,	39
Locations examined and approved for telephone conduits,	11
Locations examined and approved for gas pipes,	15
Locations examined and approved for electric light poles,	138

One hundred one (101) cross sections and estimates of the cost for pavements and other street improvements, together with schedules of work accomplished, have been made as required by the Street Department.

Twenty-six plans of street locations were made and filed and duplicates furnished for recording.

Fifteen general plans were made for other street purposes.

SEWERS.

The total mileage of sewers and drains built during the year amounts to 3.477 miles, for which the usual designs, gradients and other assistance were given.

The building and addition of several acres of new filter beds at the purification works required the active co-operation of this department.

The Beaver Brook improvement has made further advance during the season, and offers opportunity for a better comprehension of what the ultimate work will present. Could this work be completed the coming season between May and Chandler Streets, and the brook diverted to its new channel, it would then be possible to prevent the accumulation and stagnation of water between these points, and thereby add materially to the healthfulness of the locality. It has been evident that the dumping of waste material over the surface of the meadow could be controlled by the city with advantage, by carrying the work on in a systematic way, and bringing its surface to conform with the surroundings, and its final utilization in a way satisfactory to the citizens of that section of the city. Designs for concrete bridges at the streets crossing the new channel have been prepared.

Four hundred sixty-six (466) sanitary and surface drains were inspected during the year, and gradients given therefor.

Twenty-one (21) plans of sewer locations, with their duplicates for filing, were made during the year, together with the necessary plans for construction purposes, and the usual records of work accomplished.

Water.

Further preliminary work towards the ultimate use by the city of Asnebumskit Brook as a water supply was made during the season by the completion of the small diverting dam begun last year. The work has been carried on in a very moderate way, and some small advance was made in the construction of the canal through which the stream will eventually flow. This part of the work should be completed the coming season, in order to protect that already accomplished, and in anticipation of its possible use.

The completion of the swamp drainage at the headwaters of Kettle Brook, and other protective work, has materially benefited this portion of the water supply. The further planting of evergreen trees over the areas now bare and owned by the city should be carried on. Their immense value to the water-shed of the stream would eventually be realized, and at

a present small outlay of interest or money. Other areas upon Tatnuck Brook should be similarly treated.

With the continued growth of the city and consequent increase of water consumption, the daily draft from the sources of supply has reached such proportions that the frictional loss of head in the mains from the Lynde and Tatnuck Brook reservoirs has a serious effect upon the water pressure in the city when the draft is much above the normal consumption. Both of these mains were laid many years ago and are insufficient for the uses of today. In the absence of fires of any considerable proportions their inadequacy is not realized, and only when emergency arises is their real weakness apparent. In my opinion both of these main pipes should gradually be replaced with large ones.

A complete set of maps of the entire distribution system of the city is being prepared for the use of the Water Department.

Miscellaneous.

The surveys of a miscellaneous nature are as follows:

Assessors' Department:
- Survey for books of plans together with maps and excerpts of deeds.

New Rifle Range:
- Plans and estimate for new rifle range.

Public Buildings Department:
- Surveys of estates, levels and batters for new public buildings.

Health Department:
- Isolation Hospital batters for new buildings.

Hope Cemetery:
- Measurements of lots.

Parks Commission:
- Grades for new granolithic walk on Common.
- Establishment of boundaries at Grant Square Park.

Water Department:

Line and grade given on streets for laying pipe,	20
Surveys made for pipe location,	2

Street Lighting Department:

Survey new storage yard at Harlow Street.

The total number of plans made by the department for various purposes amounts to 181.

GRADE CROSSINGS.

The confirmation by the Superior Court of the decree abolishing the grade crossings along the southern railroads is a cause for felicitation to the department, as much time and effort have been devoted to the work almost continuously for the past fifteen years through co-operation with the Law Department. It is a relief from a trying service required from the various commissioners, legislative matters and hearings before the final commissioners, five years alone having been occupied in reaching a conclusion. It is to be hoped that the actual work of construction will be in evidence in the near future.

To my assistants, for their efficient and faithful support, my appreciation is gratefully acknowledged.

Respectfully submitted,

FRED'K A. McCLURE,
City Engineer.





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